


1990

# Design principles and visualization of development proposals for the Des Moines riverfront

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Design principles and visualization  
of development proposals for the Des Moines riverfront

by

Satish Reddy Malipeddi

A Thesis Submitted to the  
Graduate Faculty in Partial Fulfillment of the  
Requirements for the Degrees of  
MASTER OF COMMUNITY AND REGIONAL PLANNING  
and  
MASTER OF ARCHITECTURE

Majors: Community and Regional Planning  
Architecture

Signatures have been redacted for privacy

Iowa State University  
Ames, Iowa  
1990

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## **CHAPTER 1. INTRODUCTION**

### **Review of Riverfront Development**

Practically all large cities are located on oceanfronts or lie next to navigable rivers. Rivers have always served as guides of explorers, pioneers and travelers. They were the natural highways of all civilized nations. The early settlements were directly linked to the accessibility of navigable water as it was the primary source of transportation.

"A waterfront is a significant resource and a challenging opportunity for a city; a chance to be an escape valve for the pressure cooker of crowded city life, a chance to be a breathing edge of city living" (Moore, 1971).

The development of the waterfronts can be used by the city to help reach a demanding, and much higher standard of design and quality of amenities in our surroundings. Therefore, it becomes important not only to make use of these underutilized areas but also to improve the central business district (CBD) and tax base by developing it as a significant space.

The water itself offers the naturalness of open space, views, and a unique micro-climate, which act as catalyst to activate the recreational potential. The riverfront's proximity to the CBD helps to increase the value of city's most profitable land. For example, in Buffalo, New York, the riverfront was used to relieve the

housing problem, in Oakland, California, to increase revenues from properties of declining productivity, and in Boston, Massachusetts, to preserve a vital part of its image as a historic city and to stabilize recent redevelopment in the CBD. In other cities, waterfront potential has been used as in Seattle, Washington, to create better public-oriented spaces, or in Louisville, Kentucky, to give the city an image that is both river/amenity-oriented and forward looking, or in New Orleans, Louisiana, to utilize what amounts to a land bank as a "safety valve" for intensive development threatening a fragile historic area (Balchen and Linville, 1971).

Des Moines riverfront development has a long history. The City Beautiful Movement at the turn of the century coincides with Des Moines' efforts to locate civic buildings along the riverfront to symbolize efforts to clean up the city physically. The Court Avenue bridge, river wall and balustrade, Library, City Hall, Armory, Police Station, Polk County office buildings and Federal Court House were constructed between 1900 and 1937 as part of the City Beautiful Movement (Des Moines Register, 1987).

According to the report prepared for the city by Barbara Beving Long of Midwest Research, "The period saw the first attempts nationwide at urban planning, and Des Moines' success served as an example for other medium sized cities". Long continued, "From an ugly duckling of haphazard development, garbage strewn and eroding river banks, deteriorating iron bridges and cheap buildings, the riverfront emerged as an orderly combination of natural and man made beauty" (Des Moines Plan and Zoning, 1973).

Harlan Bartholomew, one of the leading urban planners of the 1940s and 1950s, having become familiar with Des Moines, called it "the most dispirited city he had

seen in the country". William J. Ludwig, architect and urban planner of West Des Moines argues that this is no longer true. Des Moines is alive with a tremendous revitalization of the downtown core. New office towers designed by the leading architects of the nation, integrated skywalk systems, The Court Avenue District and redevelopment of the east Capitol District are signs of vitality (Des Moines Register, 1989).

The question of how to make a city vibrant and continue to be vibrant has just begun to receive attention. It is an urgent question--one that offers a challenge to the riverfront development which, up to now, has paid too much attention to urban renewal projects but not enough to the hidden secrets of what gives a city its pulse and life. Waterfronts are classified as beautiful or ugly, according to the impression made on the mind of a casual observer as one hurries past to his/her work or other activities. Presently, Des Moines' riverfront is in the state of physical and economic decay. Once the focal point of downtown, the Des Moines River now is isolated with levees constructed by the Army Corps of Engineers in the 1960s as part of the Saylorville Dam flood-control project. Fountains, gardens, walkways and steps leading to the river were destroyed in that construction. At the same time, the bridges, Walnut Street, Locust Street and Grand Avenue, were rebuilt and stripped of their turn-of-the-century detail. According to Patricia Zingsheim, a principal planner in Des Moines, "The river has more or less been treated as an enemy and the levee is seen as the line of defense" (Des Moines Plan and Zoning, 1983). Des Moines officials believe having the downtown riverfront on the National Register of the Historic Places will give the city an advantage in the competition for federal money.

Five years ago, the riverfront was among the most depressed areas of Des Moines. Today, it still appears abandoned, but an array of plans from the public and private sectors make it a promising area to revitalize or at least a hope to reclaim the downtown riverfront. Now the city is embarking on important linkages of clusters of activity to link the riverfront with the surrounding public places. It is hoped that the riverfront development will create a legible matrix to finally give the city a distinct image.

### **Existing Problems**

1. Lack of image and focal theme has not helped the core city to realize its potential.
2. The binodal, unequally balanced downtown, bisected by the Des Moines river, lacks sufficient linkages required to create a cohesive core area.
3. The quality of existing riverfront lacks competitiveness with newer developments.
4. The riverfront is underdeveloped, and use of the river for active and passive uses is generally limited, particularly near the core.
5. Parking facilities are fragmented and inappropriately located along the riverfront.
6. Too many vacant, old and neglected buildings are on the east side of the river.

### **Assets**

1. The natural asset of the river and its setting continues to be a distinct quality of the downtown.
2. The downtown retains its role as the historic focus of the region.
3. The current investment climate has attracted new development on both sides of the river.
4. The river bank improvement program and the downtown study plan are proceeding at the same time.
5. The Court Avenue District is the historic center for the downtown.
6. The proposed bypass probably may become a logical link to connect the east and the west sides of the downtown.

An array of riverfront plans has provided an opportunity to make special recommendations for the improvement of the riverfront by the creation of public open spaces. In the future, these spaces may serve as an urban open-space resource, and in time new activities may develop to attract people to the riverfront. The very existence of this space will enhance the value of land on its borders and serve as a future magnet for the uses which develop on its edge.

### **Assumptions**

The following assumptions reveal that Des moines has overlooked the productive functions which the riverfront could serve, and many lands within these areas remain underutilized or unproductive.

1. Des Moines riverfront is a special class of natural resource. It is distinct in its potential to afford diversified opportunities for economic development, public enjoyment and civic identity.
2. An urban design plan emphasizing the natural environment of the Des Moines riverfront would fit well and contribute to the city's economic development.
3. Proximity to downtown Des Moines and the State Capitol present excellent conditions to reinforce its unique location and function as a physical and visual link.
4. The need for water and non-water dependent uses and the interest of many developers are being addressed on public/private partnership basis.
5. The importance of strong link between the east and west sides places special emphasis on the riverfront.
6. What capitalizes on the existing functional, physical and historical linkage between east and the west sides of the river has important bearings on the riverfront.

## **Purpose of the Research**

The study started with the basic assumption that the Des Moines downtown and the riverfront area are underutilized after the end of the normal business hours. This causes many visitors and residents of Des Moines to feel the area is deserted and unsafe. With this assumption in mind, the research is focused in two major areas of concentration.

### **1. To derive design principles for the Des Moines riverfront development**

The design principles are derived from the findings based on the historical review of the riverfront and the survey analysis of the user behaviors at different public places in downtown. The basic assumption behind this survey was that the surrounding (existing) public places in downtown would suggest the type of development needed for the Des Moines riverfront. Based on the findings from the analysis, guiding principles are derived for the future development. These principles assist developers in proposing active river-oriented public places along the riverfront. It will cover the basic design concepts in terms of open spaces, pedestrian movements, linkages and proper physical connections in relation to the surrounding public places.

### **2. To propose a visualization tool for the Des Moines riverfront**

The second area of concentration in this study is to propose a visualization tool using computer aided design (CAD). The proposed tool assist a designer to visualize the proposals in relation to the existing height and set-back relationships. This is done using Movie.BYU, a three-dimensional surface modelling software. Using

this software, a three-dimensional model of Des Moines downtown was created. Based on the derived guiding principles, proposals are developed and incorporated into the existing model. The software assist to generate rendered perspective images from any given location to visualize the physical environment of the proposed development.

Figure 1 represents a conceptual approach to the proposed research design.

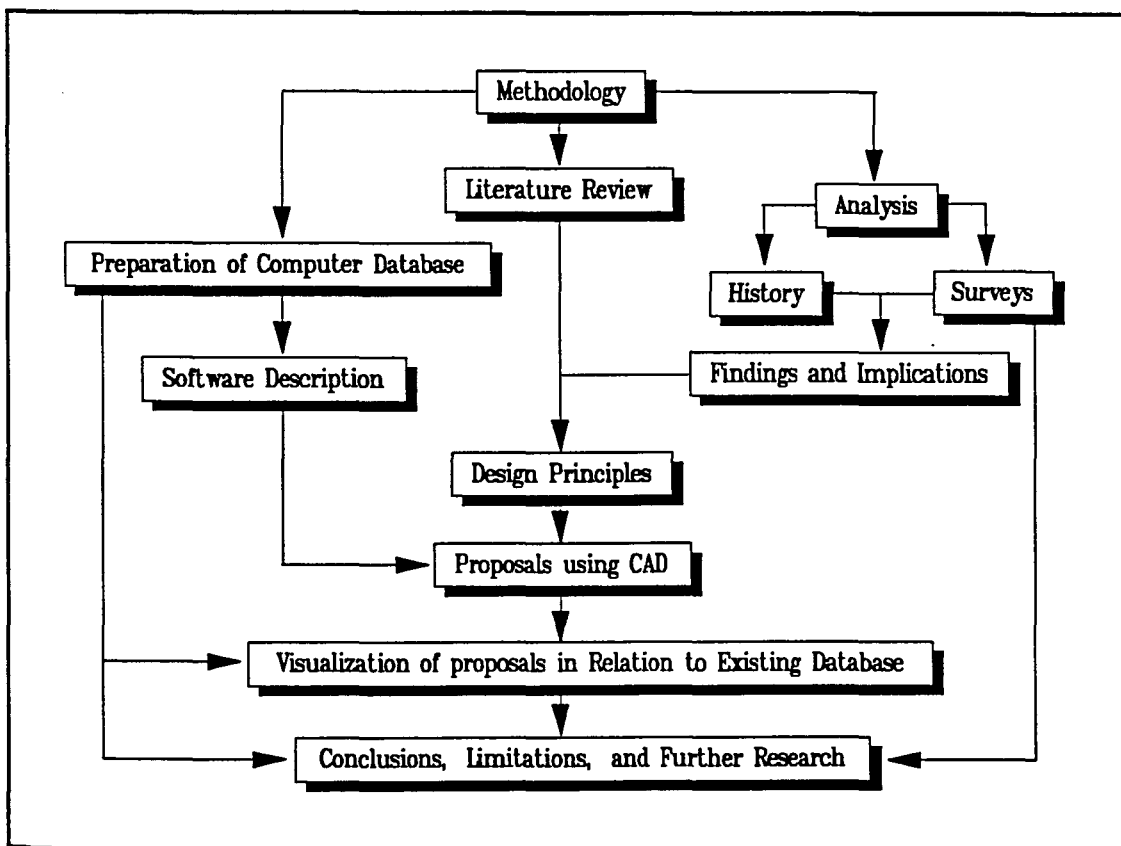


Figure 1. Conceptual research design



## **Methodology**

The discussion proceeds with the literature review on riverfront development in general. The information and data offered in this research are based on literature concerning waterfront studies listed in the bibliography. An examination of related subjects is included such as the potential for riverfront development, problems for cities, zoning impact, planning approaches and urban design concepts.

The next step consists of the identification of the study area. The selection depends on size, characteristics and geographical setting of the downtown framework. The study then focuses on the analysis in two specific areas.

### **1. Historical Analysis**

The historical analysis of the study area covers the development approaches of the riverfront since 1800s. The study explores two major historical movements in the American history: Westward Expansion and The Progressive Era. The findings from this analysis would contribute in the process of developing guiding principles for the future development.

### **2. Survey Analysis**

To derive the guiding principles for the riverfront it is important to understand who visits the riverfront, what their behavior is in public places, and how the users feel the riverfront meets their expectations. These questions are addressed through personal interviews conducted by the author at different public places in the study area. The survey addresses the following questions:

1. Does the riverfront attract people to spend more time in downtown?
2. To what extent does the riverfront contribute to people spending more time in downtown?

3. Does the riverfront provide a diversity of experiences and activities?
4. Does the riverfront development induce demand for housing in downtown?
5. How do the visitors feel about the functioning of the riverfront development?

In addressing these questions, the survey meets two objectives. The first objective is to learn to what extent the above stated questions are being met. Secondly, an understanding of pockets of activities in public spaces throughout the downtown is studied in an attempt to link the binodal Des Moines downtown through the riverfront development. Conclusions are drawn from the above two objectives to describe the operation of existing public places and their implications on the proposed riverfront development.

A three-dimensional computer database of the entire downtown was prepared which includes existing structures, building heights and interrelationships of structures. The model is used for visual studies of the riverfront by incorporating the proposals into the existing database. This visualization tool is used to indicate the relative positioning and sizes of building envelopes at the final stage based on the derived guiding principles.

In the next stage, based on the historical analysis and the survey results guiding principles are derived for the future development. These guiding principles are very general in nature and would assist a prospective developer in dealing with public open spaces, pedestrian movements, linkages, and proper physical connections with respect to the existing public places in downtown. The guiding principles are then be incorporated into the proposed computer model through random proposals for visual

studies. The visualization of these proposals may assist city officials in the process of reviewing the proposals for approval.

Finally, the thesis concludes with the limitations involved in the research and the possible areas to be explored for further research on Des Moines riverfront development.

## **CHAPTER 2. LITERATURE REVIEW**

### **Historical Background**

Many problems concerning waterfronts can be traced back to their historical development. As waterfronts developed in the tide of commercialism, they seem to have lost their civic qualities. Court squares, parks, plazas and other public areas, once used as places for public assembly, exhibiting purposes, passing the time of the day, and meeting and conversing with friends and acquaintances, have gradually given way to parking lots and expansion of commercial activities. These areas that made each city distinctive expressed the character of the community as a whole. Wrenn (1983) describes the present situation in a historical context:

"Urban waterfronts in North America have historically suffered from a lack of vision and management in their adaptations to successive demands for new functions. Traditionally waterfront development and growth has been disjointed and incremental, characterized by a web of loosely related decisions and actions by dozens of political jurisdictions and hundreds of entrepreneurs".

In the evolution of most of our cities, the fact that the river flowed through the center of the business district encouraged location of prime activities along the banks of the river. Initially produce was dumped from canoes and freight boats upon a muddy bank. As demand for water transportation increased, river slopes were roughly paved, with rock if available, or in some cases with timber. The competitive spirit led

businessmen to build private docks, and year by year private owners encroached more and more into the river, each trying to project his/her dock farthest into the river, until the congestion in the water became unbearable. During this period, property near the river depreciated in value, and the river banks became disgraced, unhealthful, and a hidden place of crime and filth. This situation gave access to the growth of all sorts of ugly billboards, garbage heaps and the banks gradually changed from one of the most desirable to the very least desirable place (Weirick, 1914). Figure 2 shows a view of the neglected Des Moines riverfront at the turn of the century.

According to Tsukio (1984), throughout history, waterfronts went through three major phases of transition: "The first transition came about with the enlargement of urban scale. With the expansion of the region, and industry, with its pollution, trouble occurred when everyone wanted to do something at the same place, namely the waterfront". Every person had the priority to be closer to the waterfront. As congestion increased and pollution became unbearable, people who could finance an industry without water dependence moved farther inland.

The second transition occurred along with reforms in transportation techniques. According to Tsukio (1984), "Water transport maintained its supremacy over all other types. However, the appearance of the railroad in the 19th Century, followed by the motorcar at the beginning of the 20th Century, brought about a relative decline in the importance of water transportation and the priority of the waterfront declined". This transition became more pronounced through the innovation of air transportation. Because of the high maintenance costs and the slow movement of the goods, water transportation became almost obsolete. The materialization of major cities such as Dallas, Texas and Denver, Colorado, which have neither coastline nor any major rivers

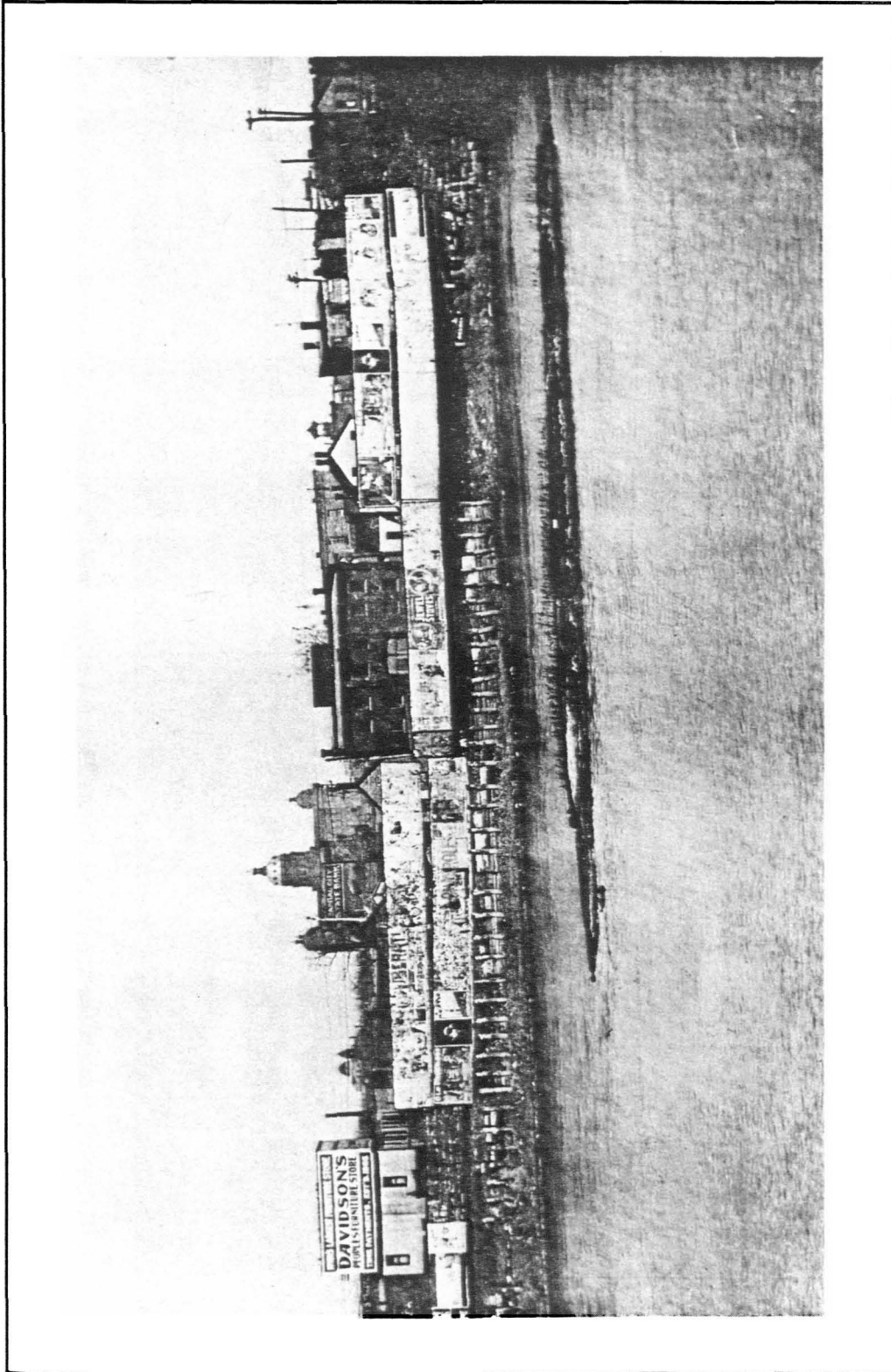


Figure 2. A view of the neglected Des Moines riverfront at the turn of the century  
(Des Moines Plan and Zoning Commission, 1983)

in the vicinity clearly illustrates this fact.

The third change according to Tsukio (1984) was brought about with the transition in industry itself: "Centers of industry moved away from the iron and steel or chemical industries, which rely on the existence of the seaport or harbor of some kind, towards the electrical and mechanical industries". These mechanized industries did not require waterfronts, and moved farther inland nearer to the interchanges of motorways, railroads or airports.

All the above mentioned factors directly affected in reducing land values along the riverfronts. Cheap manufacturing establishments grasped the opportunity to occupy these lands and started dumping their industrial wastes into the river itself.

Waterfronts which had once been the center of urban life lost its predominance. However, in the recent years there is a definite direction in which a new role for waterfronts is emerging. A totally new direction is underway to bring back life into these abandoned riverfronts. This can be summed up simply by saying, it was a plan to take them (riverfronts) away from industry and give them back to people.

### **Development Potential**

The development of a waterfront can be used by a city to increase the value of the city's most profitable land. For example, in Buffalo, New York, the waterfront was developed to relieve the housing problem. In Oakland, California, it was done to increase revenues from properties of declining productivity. In Boston, Massachusetts, it was done to preserve a vital part of its image as a historic city and to stabilize recent redevelopment in the central business district. In other cities, waterfront potential was

used as in New Orleans, Louisiana, to utilize what amounts to a land bank as a "safety valve" for intensive development threatening a fragile historic area and as a potentially huge economic resource (Balchen and Linville, 1971).

Because there is now, and there is likely to be in the future, a substantial investment in urban waterfront renewal, it is important to learn more about the functioning of newly designed urban waterfront development. Information gained from a careful examination of waterfront use could contribute to the improved design for future urban waterfront development.

The urban shore has become what architectural critic Wolf Eckardt (1984) describes as "an all but impassible jumble of freight and marshalling yards, factories, warehouses, dumps and soot". However, there are exceptions. In Chicago, for example, the city adopted a plan created by architect-planner Daniel Burnham, which established 24 of the city's 30 miles of shoreline as a lakefront park with beaches, marinas, and cultural institutions. The riverfront functions as a city's principal public open space. Burnham believed that improving the quality of life in cities through the provision of urban open spaces was critical in our country's welfare (Fein, 1962).

Like the success of the Chicago plan, one of the first instances of waterfront reclamation in the U.S. was undertaken in the 1930s in San Antonio, Texas, through the aid of the federal government's Work Project Administration. Walkways, terraces, shops and an outdoor theater were constructed on San Antonio's river banks. However, the real change appeared only in the recent past.

By the 1970s, many cities were directing public and private resources towards waterfront renewal. For example, Seattle undertook the revitalization of its central waterfront as part of an urban renewal plan for the downtown business district. A local



bond issue and HUD Community Development Block Grant funds were used to develop a 22-acre central waterfront park. The waterfront area includes the Seattle aquarium, recreational facilities and retail stores.

San Francisco's Ghiradelli Square transformed waterfront factory spaces into a \$10 million bayfront shopping and restaurant complex. Baltimore's Inner Harbor was revitalized with parks, promenades, a market and museum which linked to the Charles Center, located in the center of Baltimore's renewed downtown. The \$700 million Baltimore project, a public/private investment effort, took more than 10 years to complete. The Baltimore development team including developer James Rouse and architect Benjamin Thompson, was involved with a second major downtown waterfront revival, the Boston Faneuil Hall marketplace, and a third project in New York's South Street Seaport.

Most of the conditions of the waterfronts in terms of building mass, nearness to the downtown, and traffic movement, offered excellent ingredients for successful waterfront development. While describing this situation Catherine Donaher (1980) argues:

"These areas presented an immediate opportunity for investment that would not require massive movement of people, and they were close enough to downtown that renewal and resurgence could only enhance the focus that urban renewal had already directed to downtown".

Balchen and Linville (1971) point out that the benefits are many and they could vary from one community to another depending on individual needs and desires.

While describing the potential of riverfronts they point out:

"They are being eyed as potential sources of new income, as means of bringing life back to the ailing downtowns, as recreation or residential areas, all depending on the needs, on the nature of the waterfront or on the citizens themselves".

American cities that have taken initiative to redevelop their waterfronts, and hence maximize their potential, vary in size, geographic setting, and nature. Large cities like New York and Baltimore on the east coast, and the San Francisco on the west coast are looking at the waterfronts as an economic boost. The small and medium sized cities like St. Petersburg and Dodge Island in Florida, Oshkosh, Wisconsin, South Bend, Indiana, and Mobile, Alabama, also started focusing their attention towards their riverfronts to maximize their use (Balchen and Linville, 1971). For example, Oshkosh, Wisconsin, has developed a commercial complex on the Fox riverfront. In New Orleans, a project has been developed to open a wide stretch of the Mississippi riverfront for public enjoyment and private investment. South Bend, Indiana, and Mobile, Alabama, have already developed their riverfronts with urban renewal plans. Austin, Texas, has just reached the final stage of implementation. This project has produced a set of recreational activities along the Colorado riverfront such as a water festival, art shows, canoe racing and other people-oriented pursuits (Ghazali, 1987).

While explaining the various ways the American cities are looking at their riverfronts, Balchen and Linville (1971) explains:

"At the same time that St. Louis and other large cities are beginning to look at their waterfronts to increase the amenities of life, a small city farther down the Mississippi river is very much aware of the economic possibilities of its waterfronts".

As in many other cities, St. Louis' very existence was dependent on the Mississippi river. The river provided most of the necessities of life and helped boost its economy. In the recent years realizing the potential of the riverfront, St. Louis turned back to the Mississippi River as a public amenity. The new development of the Jefferson National Expansion Memorial, and a 19-mile riverfront parkway along the

Mississippi river became the focal points of St. Louis.

While large cities like St. Louis are trying to focus their attention on the river as a public amenity, a small city like Greenville, farther down the Mississippi River, is trying to develop a well serviced industrial park to attract business. Growth and economic development is the goal of Greenville's waterfront planning while simultaneously improving the living conditions of its people. This situation is best explained by Balchen and Linville (1971):

"One is an underdeveloped town (Greenville) hoping to pump new blood into the arteries, the other is overdeveloped (St. Louis), looking for parks, open spaces, and other recreational areas."

### **Current Issues on Waterfront Development**

According to Suzanne Contas (1982), the momentum of waterfront development is likely to continue and perhaps accelerate, despite the general economic downturn. She argues that "the private sector, however, will have to play a large role under-writing some public projects and perhaps sacrificing a share of the profits to local government as federal development funds dry up". She believes that the result of these shifts should be better thought out before any commitments are made so that a private investor may reduce the risks on investments. She continues her argument by saying that the communities must be realistic about what is suitable for them rather than trying to replicate award-winning projects elsewhere.

In a survey conducted by the Waterfront World (1982), this optimistic approach is expressed by many of the leading designers and architects throughout the United States. "Just a fraction of what's going to happen has happened yet", predicts Roy

Mann of Roy Mann Associates, Cambridge, Massachusetts. "Clearly there's going to be more of what we're seeing in the large metropolitan areas and it's going to spread to the small communities", agrees Philip Franks of DACP, Philadelphia. "I see continuing action because there's money to be made. Successes to date in waterfront projects provide the momentum that keeps the development ball rolling", says Maurice Freedman of Sasaki Associates Inc., Watertown, Massachusetts.

David Wallace of Wallace, Roberts and Todd Inc., Philadelphia, points out that "Baltimore's Harborplace, for example, is so successful that developers who have a choice opt to put their money there instead of into non-waterside projects". He also cited investor enthusiasm for projects in Norfolk, Miami and elsewhere, although realizing that the development plans in Camden, New Jersey, which was a more risky venture has suffered from the depressed state of economy. He concludes his argument with the hope:

"Where cities have done their homework and created the infrastructure that gives investors the assurances they need, development money follows. Where cities have established the rules of the game to minimize risks, waterfront investments are competitive" (Waterfront World, 1982).

One of the most important issues of the waterfront development is that whenever there is success, people rush to imitate that success (see Figure 3). In a presentation conducted by the Waterfront Center in Pittsburgh and Louisville, Breen (1982) argues:

"Do we face too much sameness, creating deadly uniformity? Will decision-makers and the general public care enough about the specialness of their waterfronts to insist on thoughtful and sensitive design? Or will they grab a formula that's working on some waterfronts and slap it on their own?"

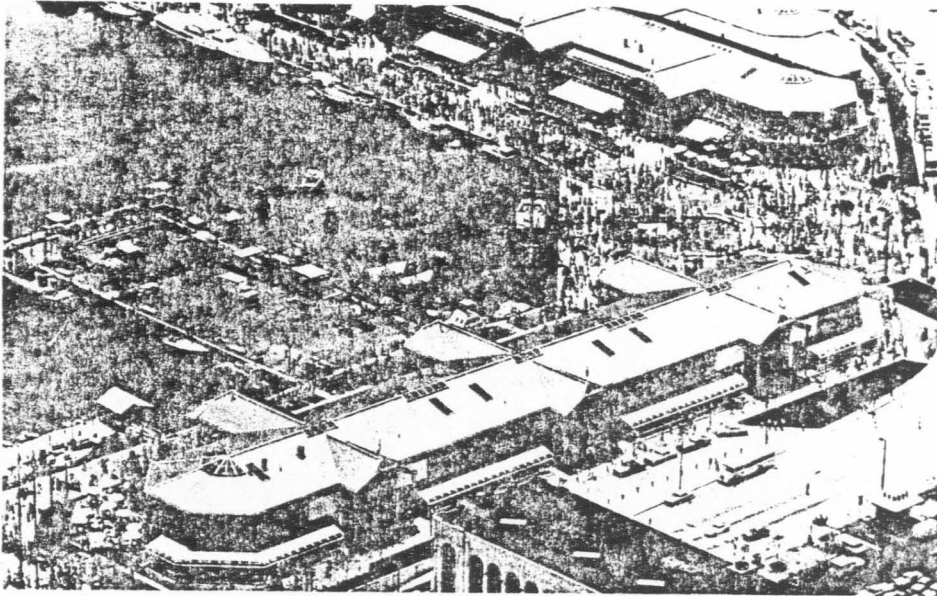
Breen (1982) further explains:

"Without quibbling over taste; whether or not you like exposed brick, the chocolate chip cookies, the Guccis, the fern bars and the stuffed bears, there's no doubt that the popular waterfront attractions in Seattle, San Francisco, St. Louis, Boston, Pittsburgh, Baltimore, and Newport are being copied and will be copied".

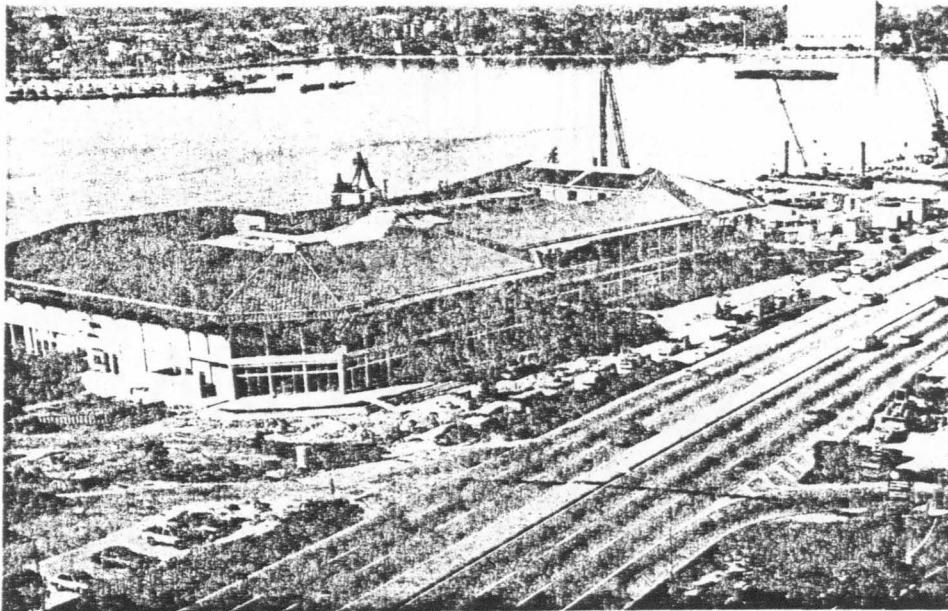
She argues that most American cities have lots of things in common but each waterfront retains its own personality by virtue of what happens on the water. Every city that has a working harbor or river has its own special style which provides a distinct image to a city depending on its history, geography and economic background, "not to mention the parade of citizens and political heroes and villains that have left their mark" (Breen, 1982).

Breen continues her argument by saying that well designed, beautifully landscaped, passive recreational spaces along the waterfront can and do work in many places. "Some people advocate very strongly that parks and parks only belong on the waterfront, not only for aesthetics and access but because of the floodplain" (Breen, 1982). This point has some validity. However, without a proper mix of activities, riverfronts become isolated and monotonous. Such has been the case in downtown Miami's very expensive and very isolated Bicentennial Park. A great deal of effort is underway to redesign parts of nearby Bayfront Park which also suffers from limited use. Plans include a festival plaza, commercial attractions and aggressive programming (Balchen and Linville, 1971).

Waterfront sites are extremely attractive to developers these days. Most often this leads to a conflict between the public interest to access the waterfront, and the rights of the private owner of the waterfront property. The whole issue of public access both physical (to and along the waterfront) and visual (the preservation of vistas,



Harborplace in Baltimore was designed to relate both to the water's edge and the city's downtown.



The Waterside is a 125,000-square-foot festival marketplace under construction on the Norfolk, Virginia, waterfront.

Figure 3. Notice the similarities between Harbor Place in Baltimore and Festive Market Place in Norfolk, Virginia

height limits) is very complex. In cities and in neighborhoods, the issue can be resolved in part by using design guidelines and tradeoffs to balance legitimate public interests and private rights (Waterfront World, 1982).

As the demand for waterfront site increases, it can increase the land values to the point where traditional uses such as businesses and industries cannot sustain their existence. This situation is well phrased by an architect Arthur C. Moore (1971) as "there is an irony in this in that very often these businesses lend an irreplaceable marine character to the waterfront".

We have a great potential for waterfront development. However, the task is not as simple as it might appear because of diversity of uses and property ownerships. Each one has his/her own interests and include conflicting interests with distinct impacts on the city and the waterfronts themselves. These problems have been well stated by Balchen and Linville (1971):

"Consider the number of parties involved: the present owner or owners; the would-be owner or owners; municipal, state, and most probably in littoral cases at least, the federal government; conservationists; preservationists; the community itself; and industry. Add to this list the money-people. Combined these factions make up the greatest deterrent to waterfront undertakings".

These ownership conflicts will give rise to a much more serious issue of jurisdiction. Waterfronts traditionally have jurisdictional structure which is very intimidating both in size and complexity. Numerous special purpose government groups have authority over waterfront resources. A combination of local, regional, and federal agencies should work together to establish a waterfront development project. Until now, only limited coordination has occurred between federal and local agencies. However, it is hoped that the roles of these governments will change in the future.

## Legal Aspects of the Riverfront Development

In most of our cities, land uses were identified and zoning ordinances were written at the time when most of the waterfront lands were dominated by industrial uses. The shift of the industries from waterfronts left waterfront lands deserted with a lack of proper guidelines for alternative uses. While addressing the issue of land use controls Wrenn (1983) explains:

"Since many old waterfronts are no longer used as intensively for such activities there is a potential for vacant land, abandoned buildings and deteriorated piers to be reused for a variety of different purposes."

There are different alternative approaches over conventional zoning (see Figure 4). These alternatives help to develop objectives case-by-case depending on the site requirements which can supplement the traditional zoning ordinance. Some of these approaches are incentive zoning, overlay zoning, special districts, and master plan area.

### Incentive zoning

Wrenn (1983) cites that "the incentives are used as a means of securing public benefits in exchange for some type of concessions given to a developer". The most common type of incentive is giving bonus floor space to the developer in an exchange for some public space. This type of incentive zoning is becoming very popular along the waterfronts throughout the United States. Portland, Maine, and Salem, Massachusetts, are two of the excellent examples of the use of incentives to encourage waterfront development.



### Overlay zoning

According to Wrenn (1983), "an overlay zone floats over the community and is placed in specific locations when and where they are deemed appropriate by the local government". Not only major cities like Seattle, Chicago, and Portland, small and medium sized cities are also using various innovative zoning techniques to encourage waterfront development. For example Toledo, Ohio, has successfully completed an overlay zoning as a public sector approach to waterfront development.

### Special districts

Special district technique is commonly used by cities as a tool to preserve historically significant places. As most of the cities originated along the waterfronts, it is very logical to incorporate waterfront sites into historic districts. These special development districts will encourage both preservation and controlled mixed use development to retain the historical essence along the riverfront. The Historic Savannah Foundation in Savannah, Georgia and Waterfront Historic League (WHALE) in New Bedford, Massachusetts are two of the non-profit local organizations which helped guide the successful redevelopment of historic urban waterfronts.

### Designate a special waterfront area in a city's master plan

The most interesting part of designating a special waterfront planning area in a master plan is that it has all the elements of zoning and more, even-though it is not considered as a zoning ordinance. It incorporates a thorough system of design and development controls that extend also to uses on water which have heavy impact on the environment (Cook, 1980).

Seattle Shoreline Master Program is one of the most comprehensive plans of this kind. According to this master plan some specific objectives apply specifically to waterfront environment. A similar "Lakefront Master Plan" was created in Chicago in 1974. The Chicago shoreline was divided into three specific zones--a "Water Zone" which extends from shoreline to 25-foot deep into the Michigan River, the "Park Zone" which includes present and proposed future park facilities, and the "Community Zone" which is a mixture of public and private lands along the riverfront. A set of guidelines are proposed to manage these designated areas (Cook, 1980).

These four zoning techniques are some of the more popular innovations which deviate from conventional zoning regulations. However, they are not the only alternatives available in dealing with waterfronts.

Jonathan Barnett (1982) describes the design review process as an alternative to the traditional zoning methods. It will monitor the quality of the proposed design in terms of height and bulk relationships to a specific site. This approach is very effective because the whole review process goes through a special review committee consisting of various professionals including architects, planners, and urban designers.

Capital Improvements Programming (CIP), defined by Frank So (1979) as a "multi-year scheduling of expenditures for physical improvements of public facilities with relative long-time usefulness and permanence", is another effective planning tool in promoting waterfront development. This program is very useful in promoting public/private ventures. A city can provide public facilities and infrastructure through Capital Improvement Programs to attract private investment in developing a waterfront project.

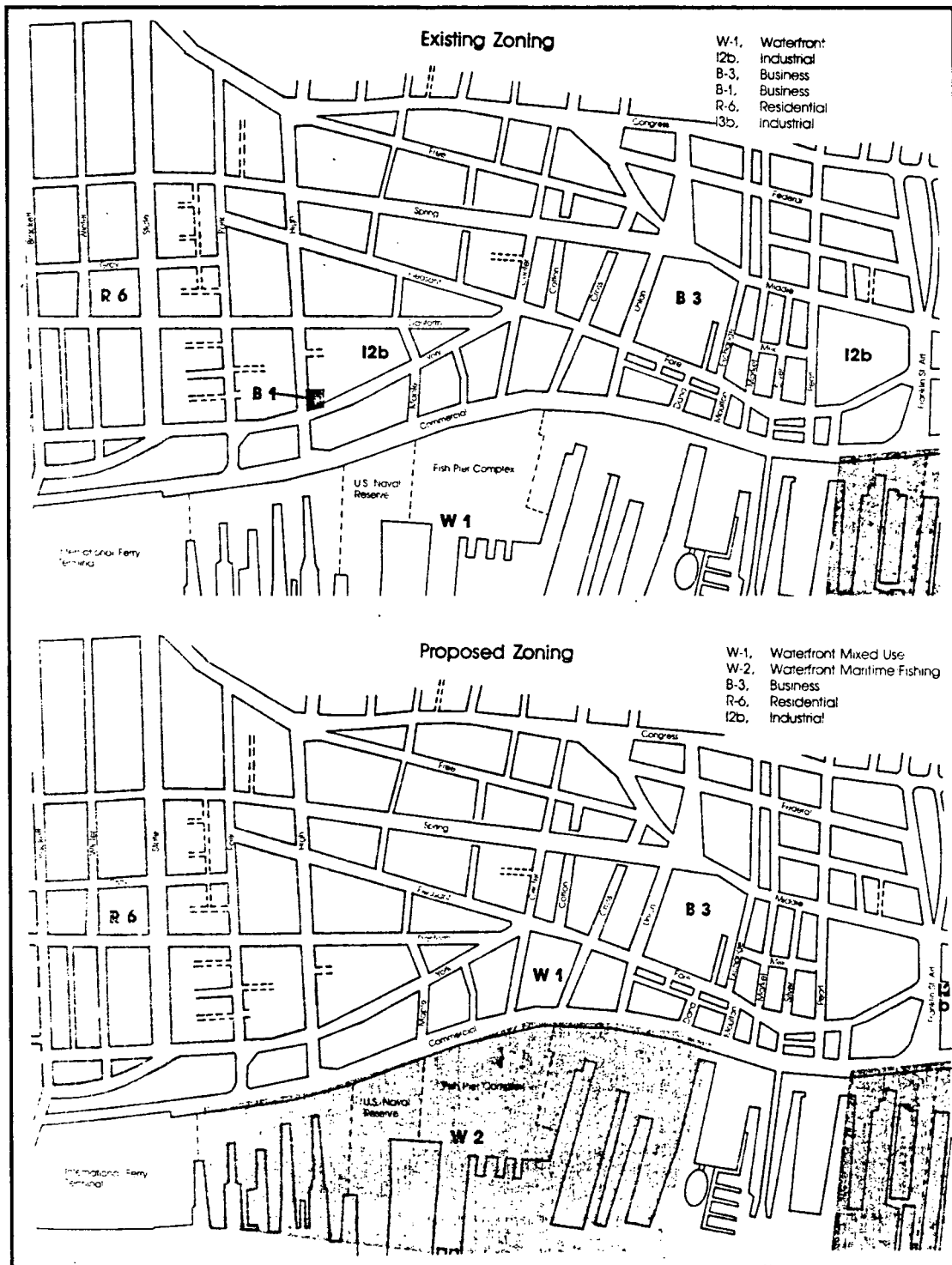


Figure 4. Innovative zoning techniques

### **Financing the Riverfront Projects**

Since urban waterfronts are too valuable a resource to be underutilized, many cities have initiated waterfront renewal efforts. While most of the proposals are challenging and competitive, it is very important to have proper financial support for these projects to become reality. One of the factors which contributed to waterfront development during the 1970s was the availability of federal funding for public improvements. In that decade, most cities used one or more sources of federal financial assistance in their waterfront development projects (Wrenn, 1983).

The primary sources of federal funds for urban waterfront redevelopment projects are:

1. The Department of Housing and Urban Development's Urban Renewal and Community Development Block Grant programs.
2. The Commerce Department's Public Works Assistance Program of the Economic Development Administration; and
3. The Interior Department's Land and Water Conservation Fund.

In 1979, the total funding available from these three programs was \$3.5 billion (U.S Department of Commerce, 1980). In that year, the federal government's interest in urban waterfront renewal was further emphasized through the establishment of a working-level inter-agency team, the Urban Waterfront Action Group with representatives from ten federal agencies, plus the National Trust for Historic Preservation, partners for Livable Places, National League of Cities, and the U.S. Conference of Mayors (Bebec, 1984).

Due to the recent cutbacks in the federal assistance, there emerged a need for various innovative techniques of private investment. While explaining the situation

Wrenn (1983) argues:

"This is not to imply that waterfront development is dependent upon government aid. John's Landing in Portland, Oregon, and Palmer Point in Greenwich, Connecticut, for example, are private development ventures. Other projects have been successfully developed entirely through private sources and certainly future projects will have to rely on similar needs of financial support. However, in many cases, federal funding was the catalyst for attracting private investment in waterfront areas".

Local governments and some non-profit organizations are taking active roles in initiating private investment rather than depending on federal funds. Davenport (1980) suggested some of the strategies which have been used by the local government bodies to finance the development of waterfronts for public and private purposes.

The first strategy to be considered is the "issuance of local bonds to finance projects: general obligation bonds that are paid back by general tax revenue and revenue bonds that are paid back by leasehold or user fee revenues" (Davenport, 1980). The city of San Diego is one of the best examples of this kind in developing a major recreational complex. The city leased part of government land to private investors for various commercial operations and the revenues from the investments were cross-subsidized to support general waterfront recreation at no cost to the San Diego taxpayers.

The second strategy cited by Davenport (1980) is "the use of zoning authority along with a technique popularized in the execution of conservation easements". The best example according to this technique is the South Street Seaport Museum. The City of New York established a special zoning district in a 11-block area in southern Manhattan. Within this 11-block area the potential of development rights were sold to the prospective developers through the transfer of development rights, and the resulting revenues were used in developing the waterfront historic district.

The other strategies, according to Davenport (1980) are through the "manipulation of various types of taxes". For example, the metropolitan area of Minneapolis-St. Paul has adopted a tax sharing device through which the "cumulative" area wide tax increase is shared among all jurisdictions in public improvement projects. A similar approach is the tax increment financing in which bonds are sold to be repaid with tax increments for redevelopment projects. One other similar approach is through the use of special taxes (parking tax, hotel tax, etc.) that can be earmarked for specific purposes.

Waterfront development projects usually require a tremendous "front-end" investment. Most often these projects require special engineering studies to assess the stability of the soil, flood control devices and many other intangible costs associated with each stage of the development process. To meet these costs Wrenn (1983) suggests the following four types of financing. He also stressed the necessity of commitments for all four types before the construction can begin.

- "1. Funds for predevelopment activities;
2. Short-term loans to finance construction before the permanent or long-term mortgage becomes effective;
3. Long-term mortgage loans to provide the basic funds;
4. Equity financing for the share of the cost and initial funding not covered by the mortgage."

Finally, he suggests that most of the waterfront projects involve high financial risks and, to attract investors, the public sector may have to finance parts of the project either directly by supplying cash or improvements or by providing infrastructure, or indirectly by giving an issuance in private financing. The city may sometimes even

have to program some public activities like feasts and festivals to induce demand for development opportunity. This public involvement in waterfront projects will spread the risks and costs involved in the development (Wrenn, 1983).

## **CHAPTER 3. HISTORY AND PHYSICAL ANALYSIS OF STUDY AREA**

### **History of Des Moines Riverfront**

The history of Des Moines riverfront can be traced back to the discovery of the Des Moines by Father Marquette and explorer Louis Joliet in 1673 (Dahl, 1978). The riverfront has always been an integral part of Des Moines and Raccoon Rivers built in 1843 as it was an easy access point for the river traffic. The town started developing in the vicinity of the riverfront. "The area that comprises the current Court Avenue District was the center of the town's development" (Haber, 1986). Figure 4 shows an artist's rendering of Fort Des Moines II as of 1844.

Des Moines riverfront history is closely tied with the two major movements in American history: Westward Expansion and The Progressive Era.

#### **Westward Expansion**

As the nation continued to expand westward in the 19th Century, more and more trade routes were needed to transport material to the new territories. Since water was the major source of transportation before the railroads, greater focus was given to the waterfronts and various proposals were written to make rivers navigable.



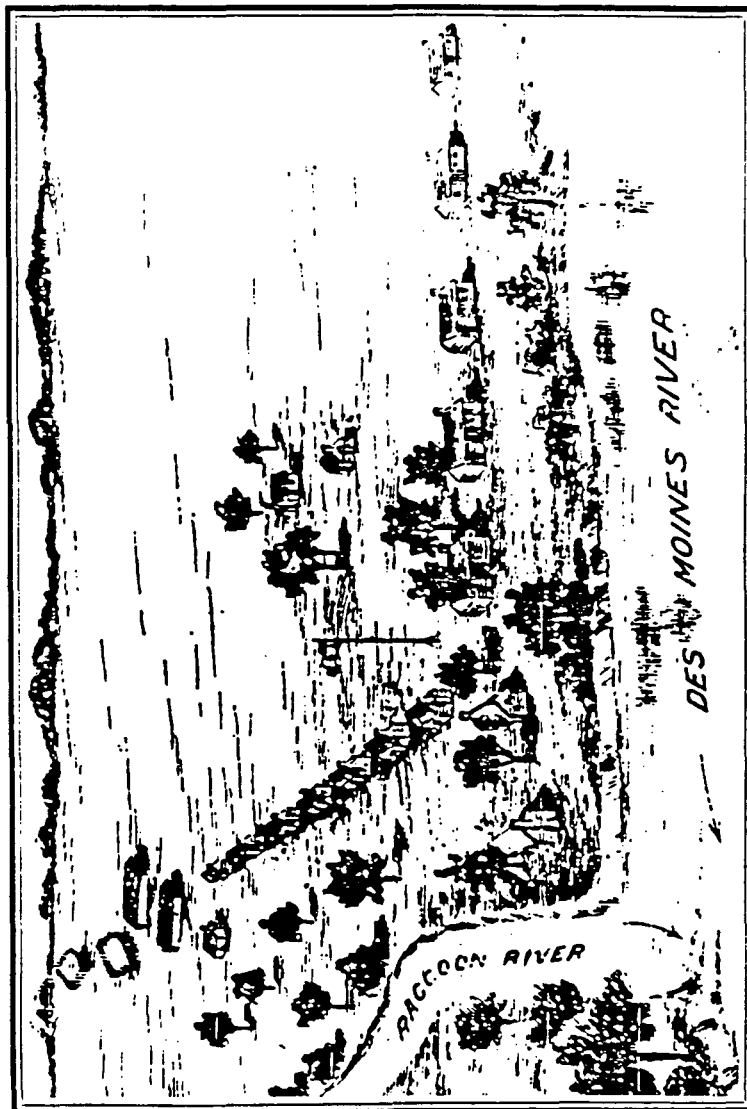


Figure 5. An artist's rendering of Fort Des Moines II in 1844

- "1846 - A Congressional Land Grant gives all of the land north of the Des Moines river up to the border of Minnesota to the territory of Iowa. The grant stipulates that the land may be sold only for the purpose of obtaining funds to help make the river navigable.
- 1847 - The board of public works is created to carry forward the Des Moines River Improvement Project to make the river navigable.
- 1849 - A survey filed with the board of public works calls for 28 dams and 9 locks to be built to make the river navigable" (Dahl, 1978).

This optimistic approach towards the riverfront, though started with great excitement, did not last long because of various legal issues on Land Grant problems and corruption involved in the governmental structure. Unfortunately the plans were never completed (Haber, 1986).

- "1851 - The board of public works is abolished and the project is given over to Bangs and Brothers Inc.
- 1852 - Bangs and Brothers goes bankrupt and the status of the project is left in question.
- 1853 - A group of Eastern businessmen form the Des Moines Navigation and Railroad Company and sign a contract to complete the project in 4 years.
- 1856 - The company contracted to complete the project is found to be corrupt and all work on it is stopped" (Haber, 1986).

By the time all the litigations were settled, rail transportation became more and more prominent and the water transportation became almost obsolete because of the slow movement of goods and higher cost of transportation (Haber, 1986).

### The Progressive Era and The Civic Center Plan

Until the early 1900s the waterfronts were overcrowded with run-down facilities, shacks and garbage. The Des Moines riverfront was no exception. It was cluttered with billboards and filled with garages, machinery shops and deteriorated warehouses. The "City Beautiful" movement at the turn of the century initiated the reformers to adopt an extensive development plan called "The Civic Center Plan" to centralize the municipal government. It was adopted to relocate Federal, State and Municipal buildings along both sides of the river to complement the State Capitol (see Figures 6 & 7). Cleanliness, which was the main goal, was achieved through neatly landscaped gardens. Some of the buildings included the City Hall, the Public Library, the Court House, Post Office, Coliseum, and the Armory (Des Moines Plan and Zoning, 1973).

"1901 - The Des Moines Public Library is completed. It is one of the first public buildings along the riverfront and complements the goal of the "City Beautiful" Plans.

1907 - The Des Moines Plan of City Government is officially passed.

1908 - The Post office is completed as part of the Des Moines Plan.

1910 - The Coliseum is completed as part of the Civic Center Plan.

1912 - City Hall is completed as part of the Civic Center Plan (see Figure 8).

1919/1920 - Municipal Court Building is Completed. It fits well with the layout of the Civic Center Plan" (Des Moines Plan and Zoning, 1983).

Along with these buildings, the landscaped open spaces were well thought out and included designed plazas and walkways. To provide proper security, walls were erected on both sides of the river and various linkages were established to provide a

proper connection between various buildings. Also because of some major floods the "Beauty Dam" was erected on Scott Street in 1935 (Haber, 1986).

#### Depression period and future trends

The third major period in the Des Moines riverfront history occurred between the late 1930s until the 1960s. This period began with the depressed state of economy throughout the United States. Des Moines was no exception. Because of the major floods in 1947 and 1954, much importance was given to the construction of levees and floodwalls to control floods under the Flood Control Act of 1958. In the process of achieving this, beautifully landscaped plazas and walkways were ignored despite their historical importance (see Figure 8).

The recent success of some of the major waterfront developments throughout the United States is influencing even medium sized cities like Des Moines in realizing its dynamic role as an integral part of cities. Since 1970, it became once again the focus of attention of many elected officials and concerned groups in Des Moines. In 1973, the "Riverfront Improvement Commission" recommended the approval of a riverfront plan concept as a potential recreational site and determined preliminary land use plan and property acquisition schedule.

"1973 - Preliminary Riverfront Development Plan officially submitted by the City Plan and Zoning Commission.

1977 - Beginning of land acquisition" (Haber, 1986).

This recreational potential is incorporated into the Des Moines 1990/2000 Comprehensive Plan as a part of park and open space program. The Botanical Center, bike trail along the river and the development of parks and open spaces along the

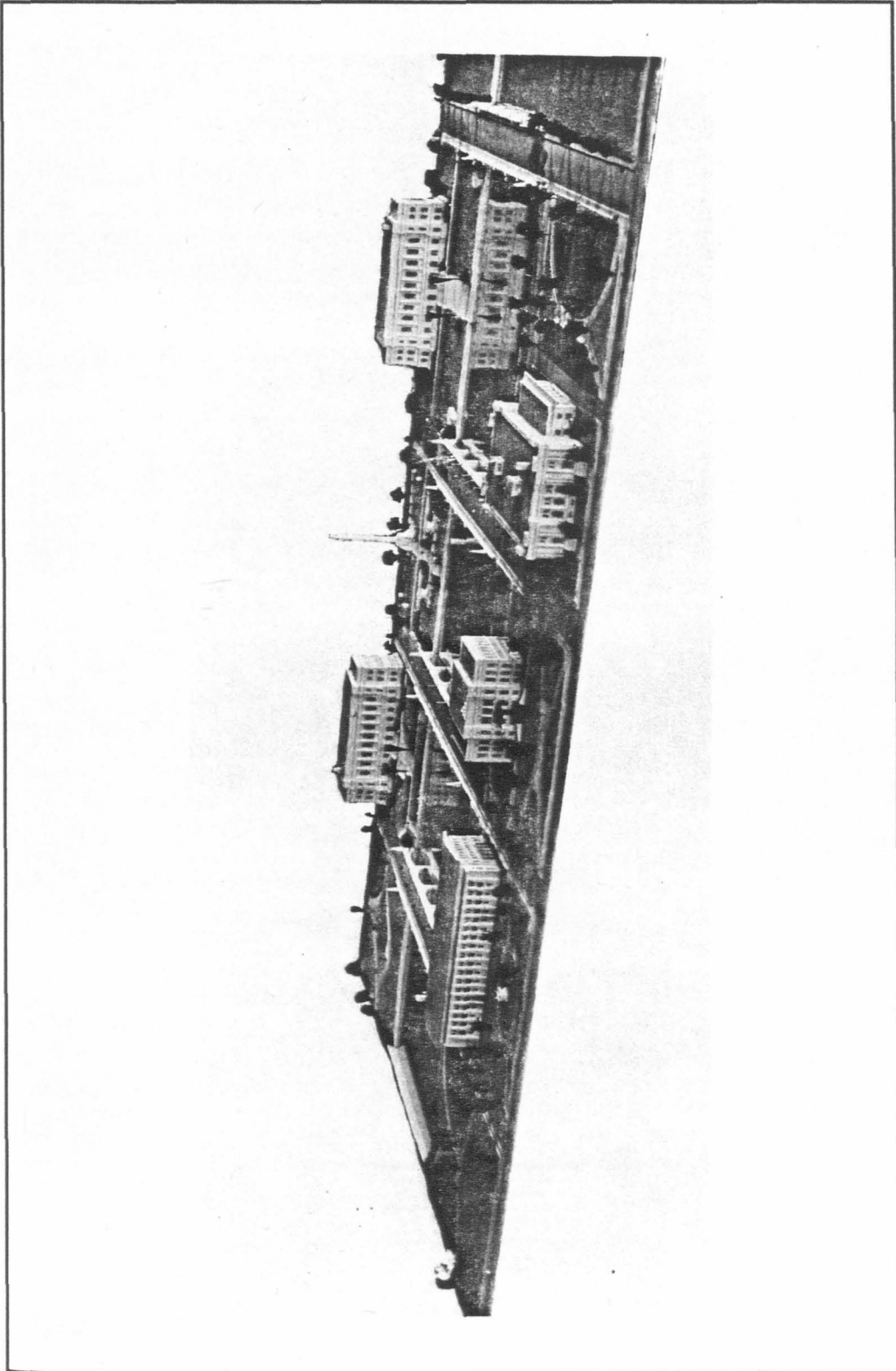


Figure 6. A model showing the proposed Civic Center Plan

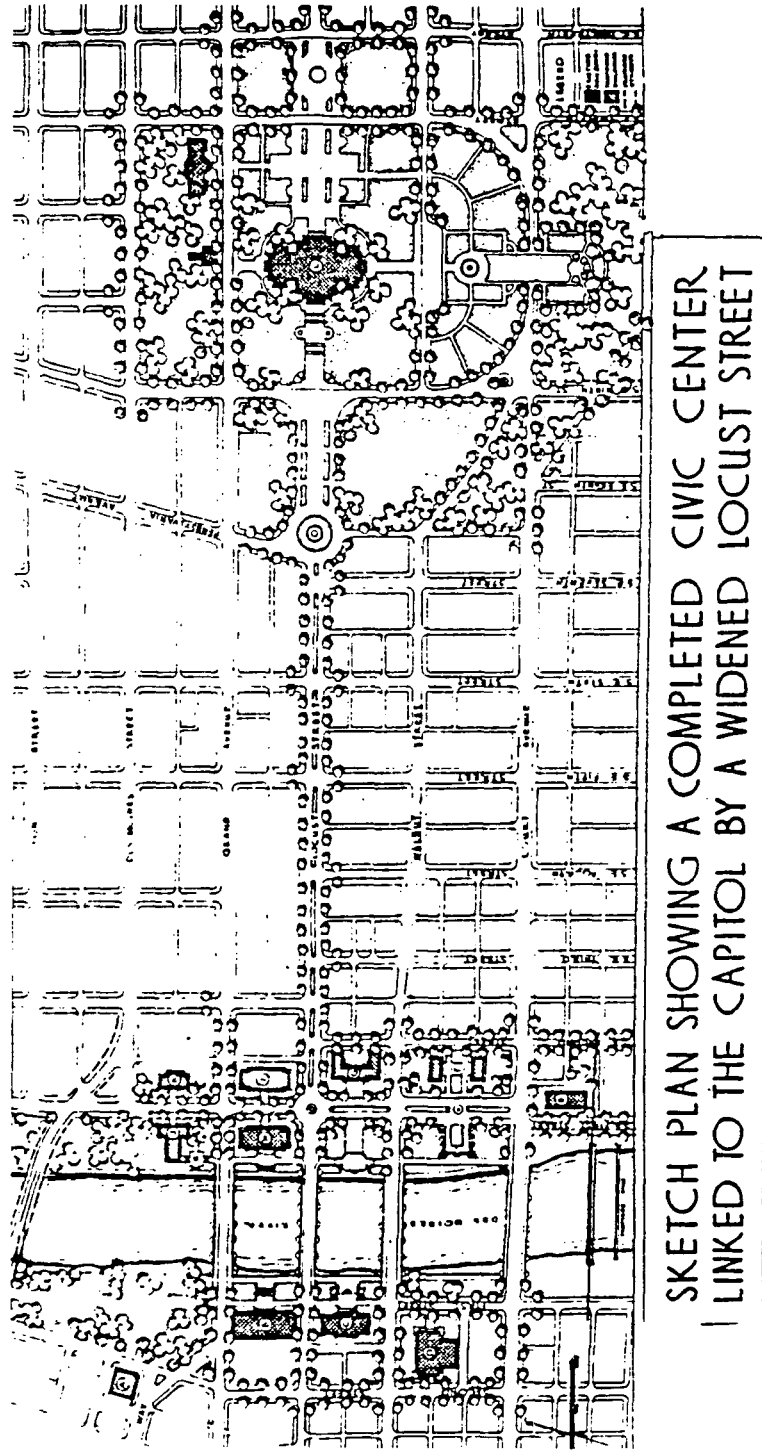


Figure 7. A sketch showing the completed Civic Center Plan

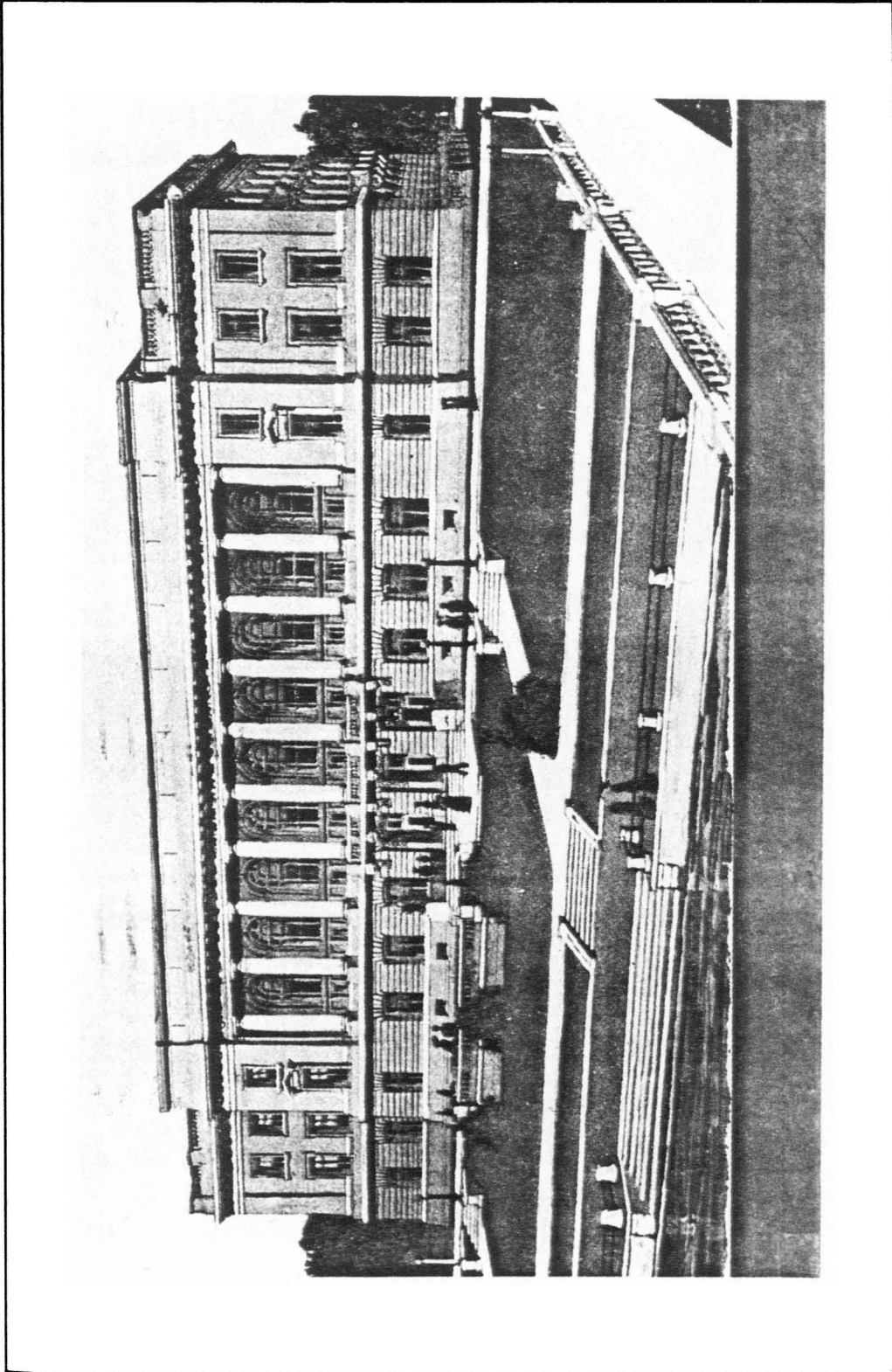


Figure 8. West facade of the City Hall with plazas and grand steps leading to the river

riverfront are some of the examples successfully executed through this plan. The most recent proposal is the extension of the Des Moines greenbelt from Fort Dodge to Oskaloosa along the Des Moines River. The main objective of this greenbelt was "to preserve the natural and cultural resources to further develop its recreational potential and to stabilize streambanks" (Haber, 1986).

According to Haber (1986) the future possible recreational features could include boat travel from Saylorville Lake to Red Rock Lake, boat docks and marinas, urban plazas, bike trails, pedestrian promenades, small parks and winter facilities. Also in the light that the Des Moines riverfront is dominant throughout its existence, it is the hope that the further development of the riverfront can play an important role in the city's development.

### **General Setting**

As mentioned in the previous section, the two important factors, the river itself and the Civic Center Plan have dictated the current setting of the riverfront and its neighboring buildings. The first wave of urban renewal at the turn of the century resulted in many old framed buildings which were replaced by brick and stone structures in the prevailing architectural style of the day. These efforts led to an impressive set of governmental buildings and open spaces on a symmetrical plan along the riverfront.

As the river flows through the core with almost a straight shaped canal, it bisects the downtown into two major but incompatible sections, the east and the west. The west side developed rapidly as the new era of concrete and glass has invaded the



downtown since 1970s. On the other hand, the east side did not receive the same kind of attention. However, city is making efforts to attract developers by giving a variety of incentives.

The two major sections of the downtown are connected with the four historical bridges (the Grand, Locust, Walnut, and the Court Avenue bridges) sustained the physical linkages between the east and the west sides of the downtown.

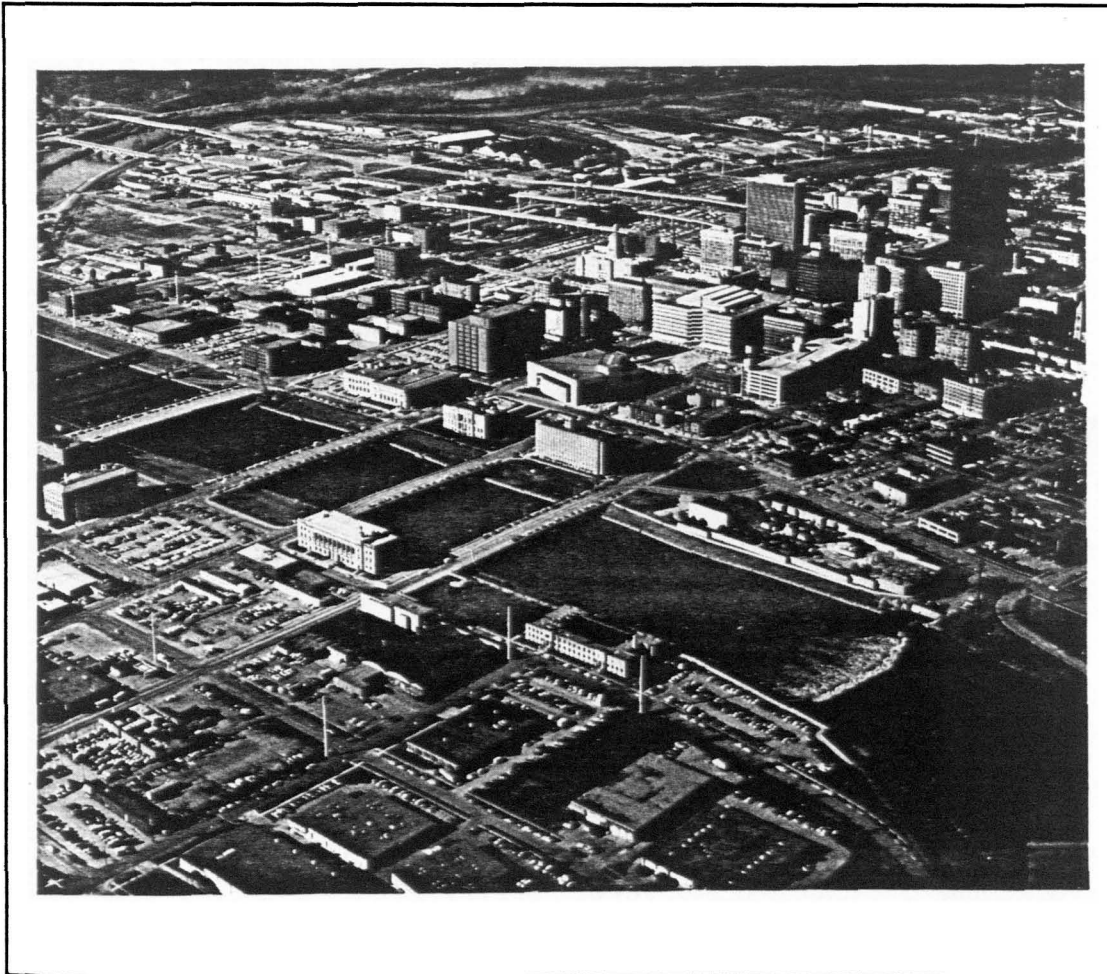


Figure 9. An aerial view of downtown Des Moines

While the downtown started moving towards the east and the west sides of the river, the riverfront sites were left out and did not receive the same attention. This let the riverfront occupy passive type of open spaces, parking lots (see figure 10) and underutilized sites such as the Iowa Power Plant occupying a large area along the river. Except for a few events, rarely any public gatherings and human activities ever occur in these parks and open spaces.

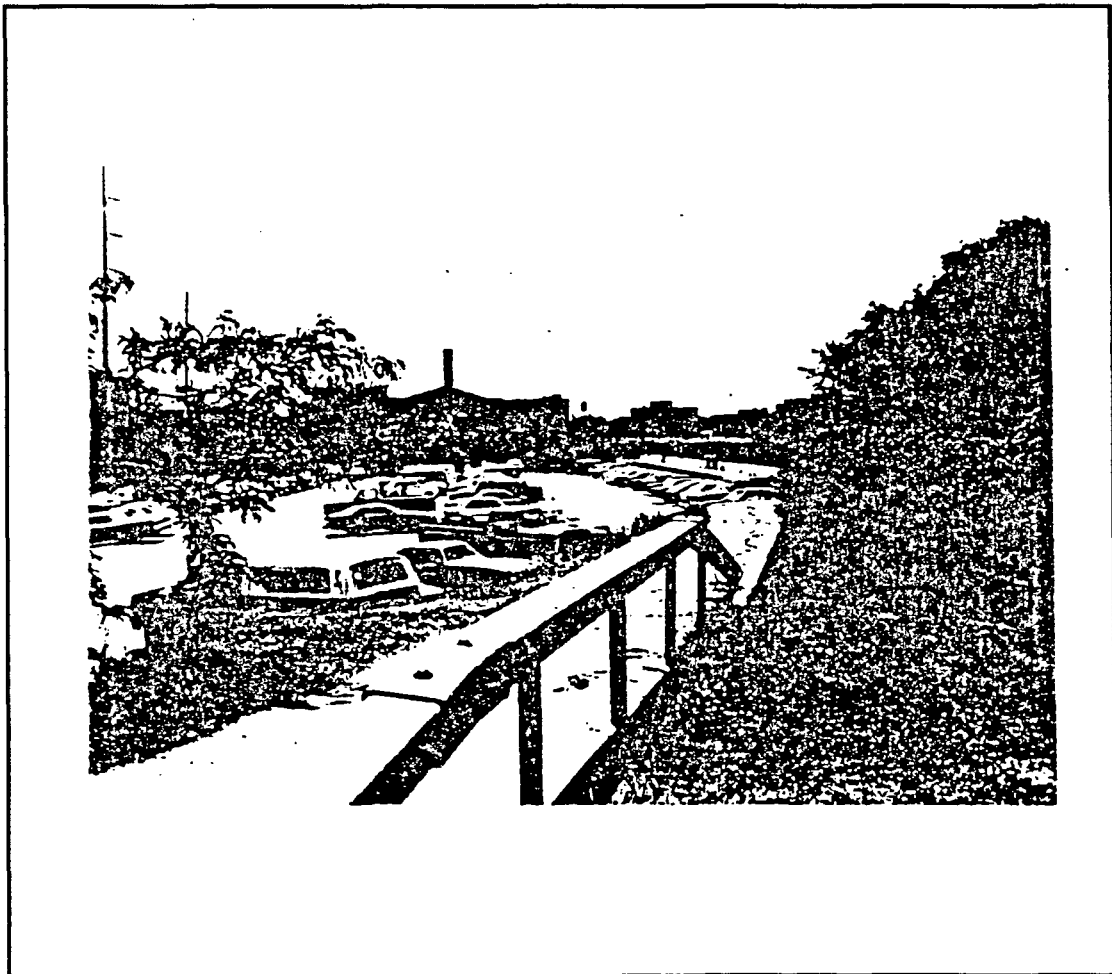


Figure 10. A parking lot along the riverfront, an undesirable land use

The primary focus of the study area extends from Highway 235 in the north to the confluence of the Raccoon and Des Moines rivers in the south and contained by East Second street on the east and Second Avenue on the west. However, other public places such as Nollen Plaza on the west, Botanical Center on the north and the State Capitol on the east will be included in the study area. This will make it possible to learn more about the characteristics of the linkages between various public places in an attempt to link the riverfront development to other downtown areas (see Figure 11).

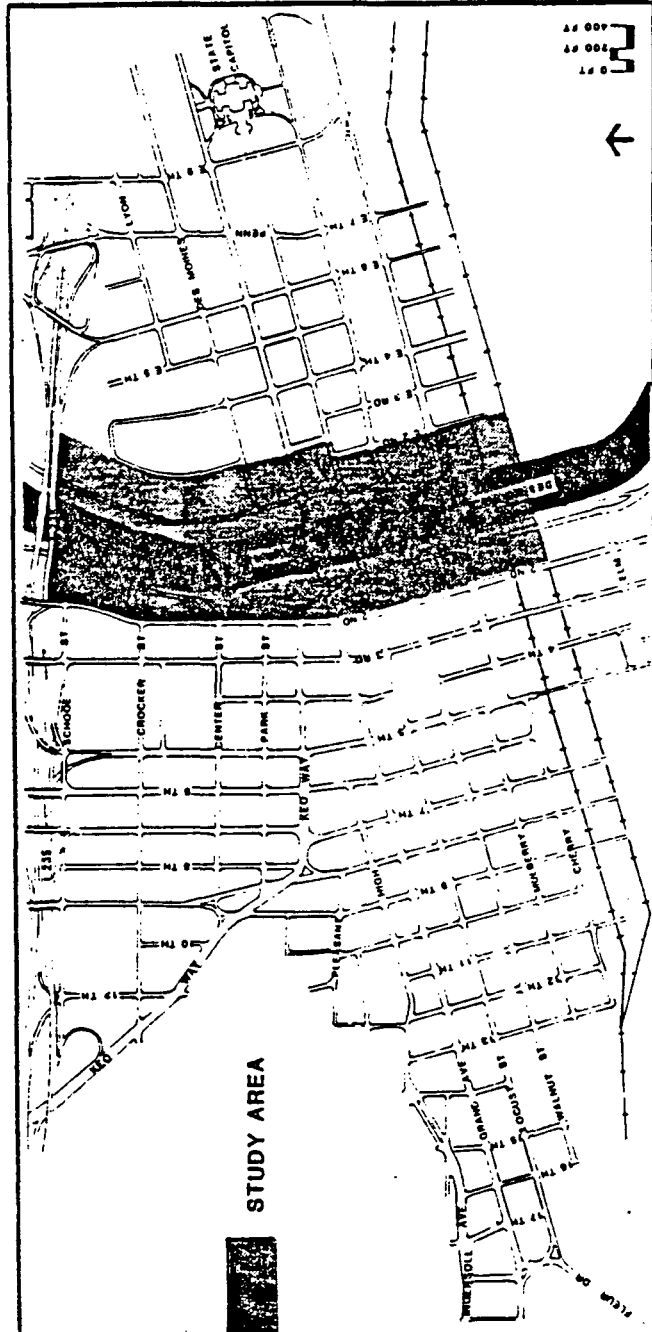


Figure 11. Site plan of the study area

### **Circulation and Accessibility**

The existence of several major barriers to movement such as the Raccoon and Des Moines rivers and the railroad lines are limiting the crossovers to a few locations. It concentrates high volumes of through traffic on the downtown street system and causes large volumes of traffic to interchange on downtown core streets.

Because of the location near the heart of the city, the project area plays an extremely important role in accommodating vehicular movement and long-term parking generated by the downtown core and nearby office functions.

As mentioned earlier, four major bridges connect the east and west sides of the river through the study area. One-way traffic is enforced on Court Avenue, Walnut and Locust Streets. Grand Avenue is retained as a two-way street. Traffic densities are relatively high on all streets especially during the rush hour. In addition, the River Side Drive stretches along each side of the river which serves as a shortcut access to downtown mainly for offices located along the riverfront.

The need to provide better connections between north-south routes and to divert traffic away from the core has long been recognized. However, the dependency of downtown workers on the use of automobiles for travel has created a large demand for parking space within and around downtown. The impact of this on the project area is substantial since most of the riverfront at present is occupied by parking lots.

The assumption was that these types of uses (parking lots) are not compatible with the riverfront development, and hence it is very important to conduct studies to provide the relocation of these parking lots. However, this study has to be carried out separately as it is beyond the scope of the study.

## **Zoning and Land Use Controls**

Zoning involves allocation of the land into districts and zones of different categories and regulating district by district, the use of property and the height, bulk, and placement of buildings.

The Des Moines riverfront is zoned as a Flood Plain District (U-1). However, according to Gary Lozano of Des Moines Plan and Zoning Commission, the current zone designation for the riverfront covers more area than that restricted by the federal requirements as the zoning was established before the National Flood Insurance Program (Ghazali, 1987).

According to the revised zoning map of 1987 (see Figure 12), the riverfront is zoned into five different districts: Flood Plain (U-1), Light Industrial (M-1), Heavy Industrial (M-2), General Business/Commercial (C-3), and Multiple Family Residential (R-4).

This pattern is consistent with the Des Moines 2000 Land Use Concept which was adopted in 1987 (see figure 13). According to this plan, the study area is divided into the following land Uses.

- Open Space/Recreation
- Public/Semi-Public
- Commercial/Service
- High Density Residential
- Light/Heavy Industrial

The current land use plan for the Des Moines riverfront is dominated by light industrial usage on most of the east side and the commercial activities on the west side of the study area. Federal and municipal offices are located on either sides of the river which are represented by Public/Semi-Public usage. A stretch of open spaces is found

on both sides of the river within the study area. However, most of these open spaces are currently being utilized as parking lots. Finally, residential land uses featuring apartments and condominiums are scattered on both sides of the study area.

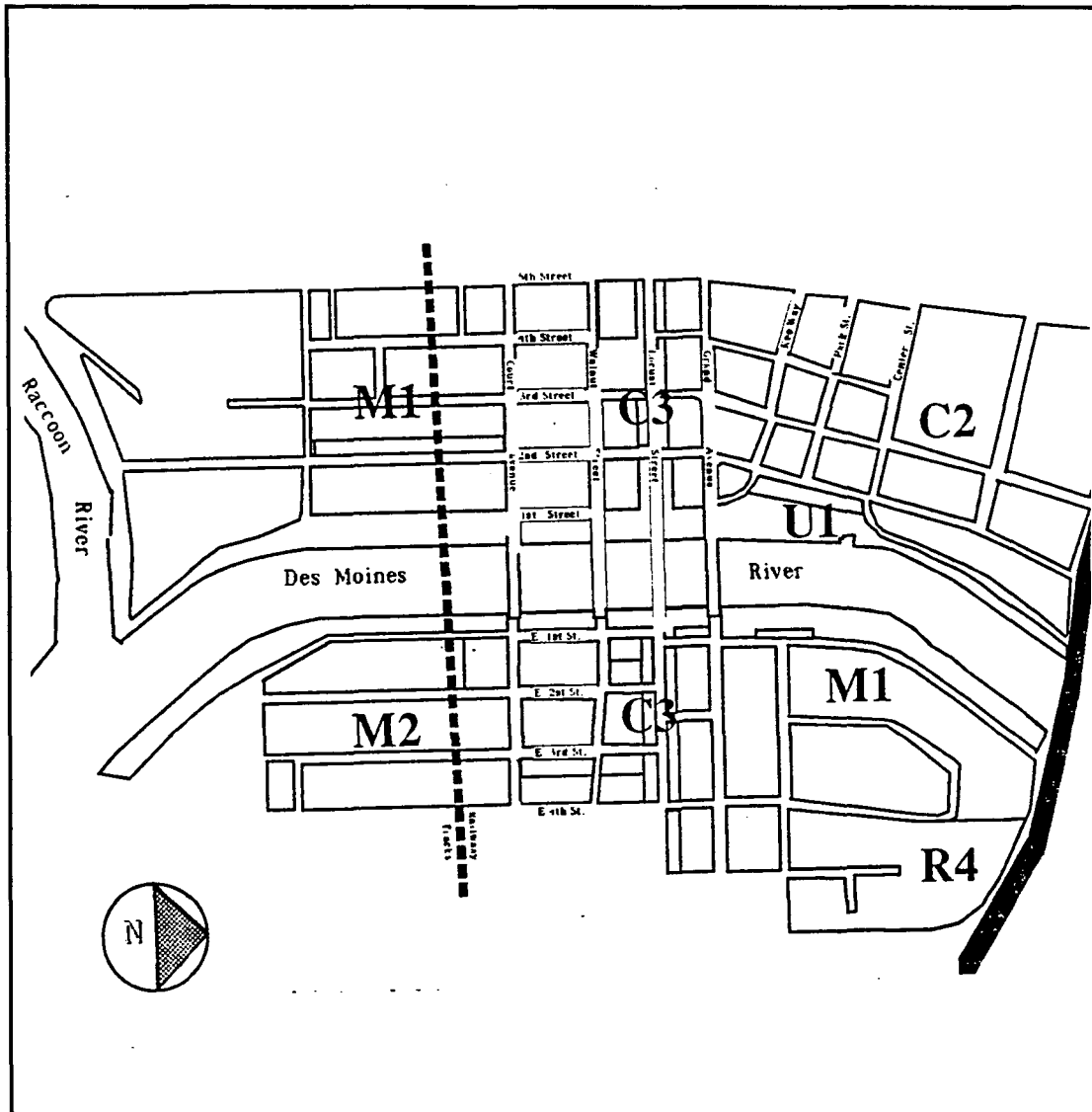


Figure 12. Revised zoning map of Des Moines downtown

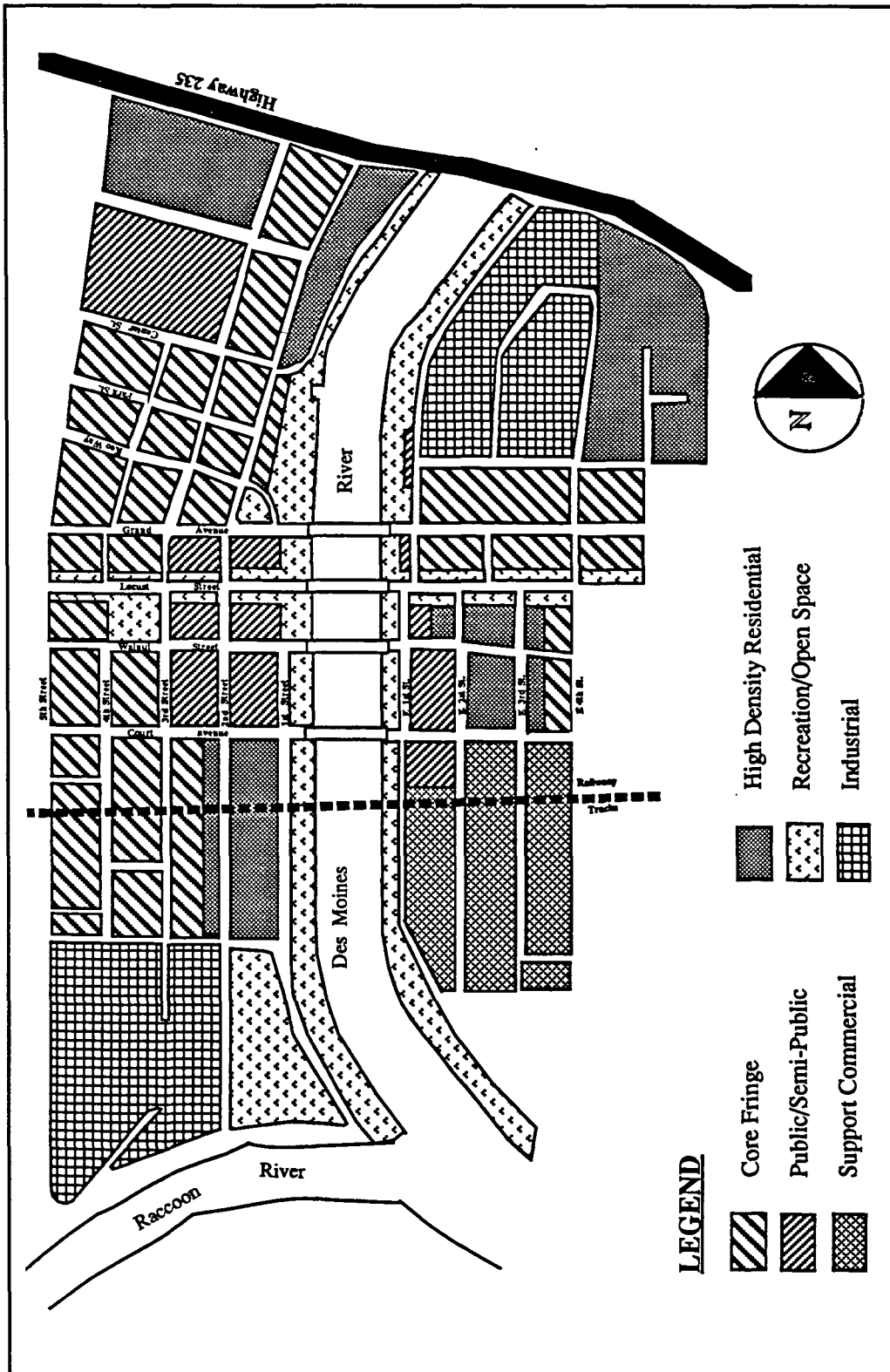


Figure 13. Des Moines 2000 Land Use Concept Plan



It is also important to note that most of the lands along the riverfront are currently owned or controlled by the City of Des Moines. This would be an asset for the city to eliminate part of the jurisdictional problems which are very common for most of the cities in dealing with the riverfront development (refer to Chapter 2 of this thesis).

Finally, land uses along the Des Moines riverfront are also controlled by the Architectural Advisory Committee. This committee reviews the proposed projects and advises the City Council, Des Moines Plan and Zoning Commission, and the Urban Renewal Board for their approval (see Figure 14). The Committee is also responsible in reviewing the siting, design quality, consistency with the Comprehensive Plan and its relationship with the other proposed development, height restrictions, lot coverage and other aesthetic considerations (Des Moines Plan and Zoning, 1986b).

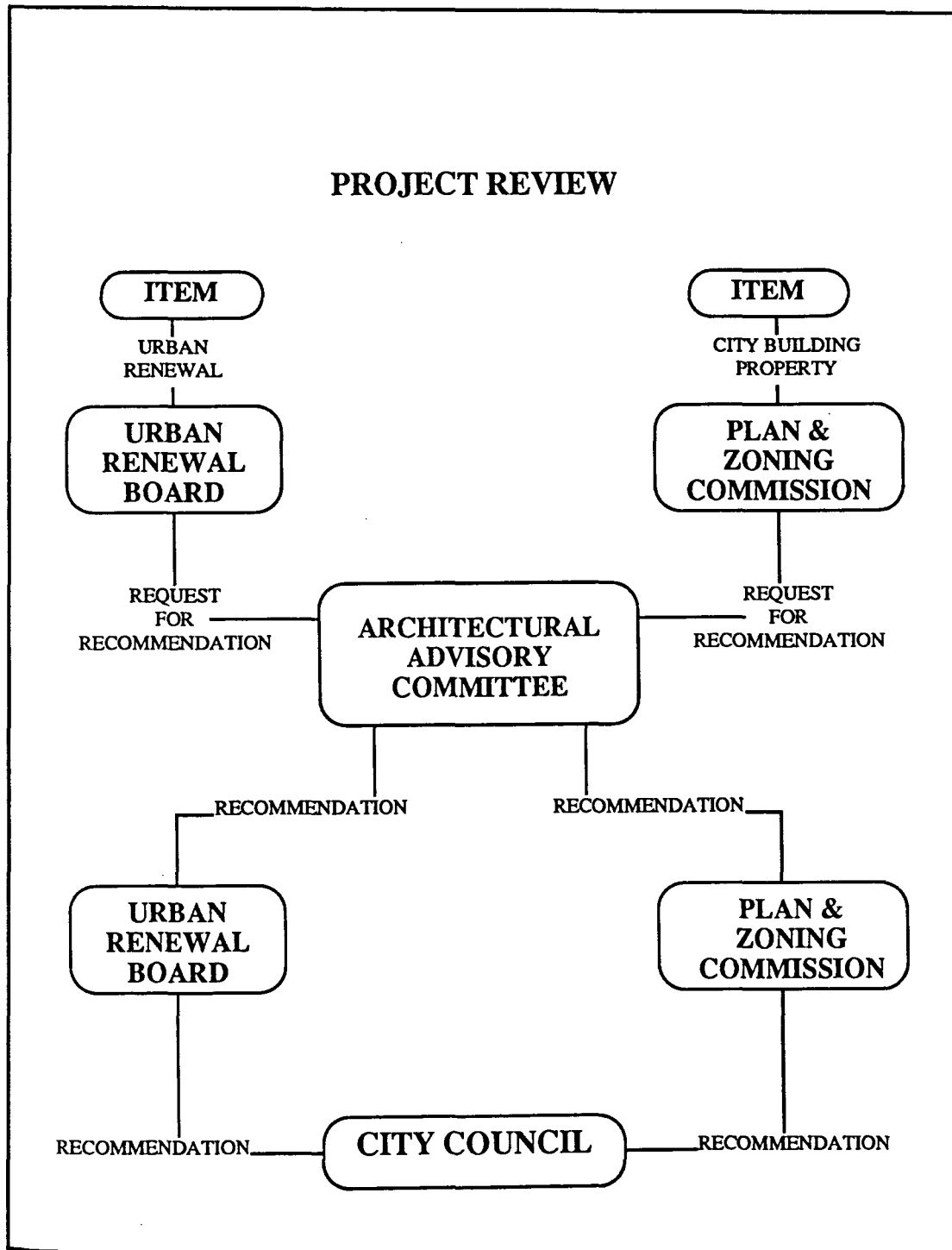


Figure 14. Project review process: Architectural Advisory Committee

## **CHAPTER 4. MODEL FOR DATA COLLECTION**

### **Rationale for Research Survey**

As social and public programs expanded in the 1960s and 1970s, there emerged an obvious need for evaluation research in the field of public-oriented spaces. The spaces are intended for public use. The waterfront renewal areas are developed to serve as major activity areas in the downtown. In response to this need, most of the leading designers and researchers contributed a great deal in evaluating the need of public demand.

Alexander et al. (1977) recommends the designer think of a design problem as a need to establish a hierarchy of needs to which the designed space must respond. For example, a well designed public space should respond to people's needs to congregate, walk up and down and sit.

Rutledge (1981) carries Alexander's concerns and stresses the importance of the "goodness of fit", i.e., to achieve maximum closeness between two entities: The form in question and its context. For example, to relate this concept to the current research, the form in this study is the Des Moines riverfront and its surrounding public places. Its context is defined through a set of goals derived from the historical and survey analysis. The "goodness of fit" is achieved through visualization of proposals (derived

from the guiding principles) in an existing downtown setting.

As forerunner to Alexander, and Rutledge's concepts, Jane Jacobs (1961) stressed the importance of the need for the designed space to respond to its program needs. While explaining the "misfit" problems between the design Program and the constructed reality, she summarizes the need in the following way: "people confer use on parks and make them success or else withhold use and doom parks to rejection or failure".

An early application of user-oriented evaluation of an outdoor environment was conducted by Rutledge in evaluating the First National Plaza in Chicago (1975). He considers that "good design is defined as that which has high functional and aesthetic merit... A plan is a statement of expectations about how a place will be used". He conducted surveys with the visitors to the plaza and his findings stressed the importance of:

- "1. Using multiple methods of data collection;
2. Focusing the study on design assumptions and objectives; and
3. Including a time sampling of the area under evaluation".

These are some of the findings which provided guidelines for the present research on Des Moines riverfront development.

In a similar research conducted by Friedman (1978) on five outdoor designed environments (an urban plaza, urban park, portions of the college campus, and two residential site plans), he recommended a structure for design research evaluation. Friedman recommended that one should not attempt an overall site behavior observation in areas exceeding one acre, but should rather depend on a spatial-sampling

of specific function areas. The methodological approach of his study includes the following recommendations:

- "1. The design evaluation focus should be derived from design objectives;
2. Time sampling should include a range of days, conditions and times;
3. Interviews should follow initial "reconnaissance" observations; and
4. Interviews should include users and non-users".

On similar lines, one of the best-known works in environmental design evaluation is Whyte's (1980) popular study of New York's small urban spaces. Whyte's research examined the use of 16 plazas, three small parks, and street spaces in New York city over a period of three years. He stressed the importance of "what works and what doesn't" on a specific environment. All these researchers emphasized the importance of the need for designers to understand how public spaces are actually used (Bebec, 1984).

### **Questionnaire Design**

At the beginning of this study, efforts were made to learn more about the historical background of riverfronts in general and to relate these general trends to Des Moines riverfront in specific. Concurrently, efforts were made to get current working files on waterfront sites. Several site visits were made for casual observations at different time periods including weekdays and weekends.

All the information gained at the preliminary stage was reviewed and analyzed to determine the best approach to understand how Des Moines riverfront should tie and link together with the existing downtown and the State Capitol.

By the end of the 'reconnaissance' stage, through the process of reviewing plans, site visits and some interviews with the city officials, it seemed important to address some of the following questions (see appendix):

1. Does the riverfront attract people to downtown?

Visitors were asked about the importance of their visit to downtown. They were also expected to answer where else they might be going in downtown to assess the importance of the riverfront. If the visitor would not specify the riverfront option the visitor was asked to specify the importance of the riverfront in their visit. This would give the importance of the riverfront in their visits.

2. To what extent the riverfront contribute to people spending more time downtown?

Interviewers were asked how often they visited downtown, and how often they intended to visit in the future. They were also asked about the time periods (weekdays and weekends) when they usually visit. This will contribute to analysis of the peak and non-peak usage of public spaces in downtown. With the intent of finding out visiting habits, interviewers were also asked how many of people came with them and also whether they were family or friends or both.

3. Does riverfront provide a diversity of experience and activities?

In the observation period, the author recorded various types of activities provided for public on both weekdays and weekends. In addition visitors were asked to specify what they like best about the place and also were asked to choose certain descriptions about the place from a variety of options. Also information was collected

from the city officials about various programming activities in downtown.

4. Does the riverfront development induce demand for housing in downtown?

It was the assumption that the riverfront development will act as a catalyst in inducing demand for housing in downtown. It was also logical to assume that this new housing demand (if any) will in return bring more people on to the riverfront and contribute to people spending more time downtown.

To determine this, visitors were asked to specify their place of residence. They were also asked whether they live within 15 minutes of walking distance. This would determine the number of visitors residing downtown.

5. How do visitors feel about the functioning of various public places in downtown?

Since the activities are diversified throughout the downtown, interviews were conducted at various public places within the downtown. Some portion of the questionnaire was devoted to a specific place where the interview was conducted. Respondents were asked what they like and dislike about that place, and what other places they will be visiting in their trip. In addition, visitors were asked whether they feel safe visiting that place at different time periods. This might address some of the issues on security, maintenance and accessibility problems. In addition to these questions, respondents were asked whether they came by car, and if they respond yes, they were also asked whether there were any parking problems. This is very important because currently most of the riverfront is occupied by parking lots and there is a need to address the issue of relocating these parking lots in the process of creating more public-oriented places.

To assure a representative group of downtown users, the quota was based on the demographic characteristics of the Des Moines Metropolitan area. Table 1 represents the population characteristics according to the 1980 U.S. Bureau of the Census.

Table 1. Population characteristics

Category	Persons	Percentage
<u>Race</u>		
White	172618	91
Black	13054	7
Others	3179	2
Total	191003	100
<u>Age Group</u>		
0-17	49410	26
18-34	62158	33
35-64	55556	29
65-Over	23879	12
Total	191003	100
<u>Sex</u>		
Male	89564	47
Female	101439	53
Total	191003	100

The sample was selected in the same proportion as per the above table and pre-recorded on the questionnaire before conducting the survey. A 20-minute time period was designated for each interview. During certain time periods when it was difficult to trace a person with the required qualifications, approximately 10 minutes was spent to locate a person with the required qualifications and ignored that particular



sample and interviewed the person who met with most of the requirements.

It also seemed very important for a proper mix of weekdays, weekends, event and non-event days to assure a proper mix of the sample data. On a weekday, different time periods were selected depending on the activities previously observed. These time periods include morning (8:00-10:00 a.m.), lunchtime (noon-2:00 p.m.) and evening (4:00-8:00 p.m.). These hours were made consistent for both weekdays and weekends and for event and non-event days. Also, as the focus of the study was not related to a specific site, it was necessary to have the data collected at various important public places surrounding the study area (see Figure 15).

It is also important to note that as the surveys were conducted in summer months, the data may not be consistent throughout the year (especially in winter season).

A total of 128 interviews were conducted for this study including weekdays, weekends, event and non-event days and the break-down of the interviews was evenly distributed throughout the survey. The interview was designed to take no longer than 10 minutes because it was assumed that the visitors may not spend more time from their visit for the interview. Further, the questions were kept as simple as possible within a maximum of two-page limit.

**Figure 15. Locations showing where surveys were conducted**

## **CHAPTER 5. SURVEY ANALYSIS**

### **Overview**

In the preceding chapter the rationale for survey, data collection methods, and the major objectives for the survey were identified. This chapter presents an evaluation of the data collected and assesses each objective based on the survey results. The analysis also includes the comparison of each question with reference to event and non-event days and also on the basis of different time periods of the day. The chapter concludes with an overall summary of the assessment of the survey results and their implications on the proposed riverfront development.

### **Interview Rate**

A total of 128 users participated in the survey including both event and non-event days. Table 2 shows the distribution of survey participants by location, day and time period of the interview.

Table 2. Survey participants by location, day, and time period

Day	Time Period	Location				Total
		1 <sup>a</sup>	2 <sup>b</sup>	3 <sup>c</sup>	4 <sup>d</sup>	
<hr/>						
Event Day						
	Morning	3	6	3	4	16
	Afternoon	8	5	7	5	25
	Evening	8	8	5	3	24
	Total	19	19	15	12	65
Non-event Day						
	Morning	6	1	7	5	19
	Afternoon	8	4	5	4	21
	Evening	7	7	5	4	23
	Total	21	12	17	13	63
Total of Event and Non-Event days						
		40	31	32	25	125

<sup>a</sup>Nollen Plaza.<sup>b</sup>Riverfront.<sup>c</sup>State Capitol.<sup>d</sup>Botanical Center.

### Description of Participants

Of those surveyed, 49 percent of the total respondents were female and 51 percent male. This percentage remained almost same for both event and non-event days. Looking at race of the respondents, 87 percent of the users were white and 13 percent of the users were non-white. Table 3 shows the sex, race and age group of the respondents.

Table 3. Survey participants sex, race, and age group

Category	Persons	Percentage
<u>Race</u>		
White	111	87
Black	13	10
Others	4	3
Total	128	100
<u>Age Group</u>		
0-17	16	12
18-34	47	37
35-64	40	31
65-Over	25	20
Total	128	100
<u>Sex</u>		
Male	65	51
Female	63	49
Total	128	100

## Results

### 1. The attraction of the riverfront

The basis of the assumption was that the riverfront is in the state of deteriorating conditions, deserted and an undesirable place. It was also pointed out that the riverfront is underutilized with parking lots and passive open spaces.

Primary reason for visiting downtown It was hoped that not only should the riverfront attract people to downtown, but also the people visiting downtown should be attracted to the proposed riverfront development. Users were asked to state their primary reason for their visit to downtown. Table 4 describes the nature of their visit on event and non-event days including different time periods of a day.

Table 4. Visitors' nature of visit: Event and non-event days

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Work	0	2	1	7	11	10
Visit	0	3	8	10	6	10
Shopping	1	0	1	1	4	2
Tourist	2	1	2	1	0	0
Event	13	19	12	0	0	1
Total	16	25	24	19	21	23

On a week day (non-event day) a majority of the respondents (48 percent) stated they were in downtown primarily for work, and the other 52 percent of the users

were distributed as shown in Table 4. On contrary, on an event day, a majority of the users (70 percent) were attracted downtown primarily to attend a specific scheduled event.

Importance of visit Visitors were asked about the importance of their visit to downtown. On an average, 64 percent of the respondents said the downtown visit was very or fairly important. This break up is consistent for both event and non-event days.

Table 5. Importance of visit to downtown

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Very imp.	2	5	2	6	13	7
Fairly imp.	12	11	7	6	5	3
Not very imp.	1	3	3	6	3	12
Unimportant	1	6	12	1	0	1
Total	16	25	24	19	21	23

The importance of the visit to downtown at different time periods reflects the same pattern in the morning and in the evening, except at noon. On an event day afternoon, most users (86 percent) reported that visiting downtown was important or fairly important. On a non-event day at the same time period the proportion dropped to 64 percent and by evening it further dropped to approximately 40 percent.

Other downtown destinations In the assumption that the riverfront development should attract people to the downtown area, it was also hoped that visitors would then move to other areas of the downtown and thus contribute to the downtown's economic revitalization.

To determine whether the people were visiting other downtown destinations, they were asked about their intention of visiting other downtown destinations. The following Table 6 represents the number of visitors who mentioned other downtown destinations and what those destinations were on both event and non-event days at different time periods.

Table 6. Visitors' other downtown destinations

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Nowhere	3	3	13	4	2	10
Work	0	2	0	3	8	0
Shopping	1	2	1	3	4	3
Restrnt./Ent.	9	16	10	7	7	10
River's edge	2	1	0	0	0	0
Others	1	1	0	2	0	0
Total	16	25	24	19	21	23

From a total sample of 128 (including both event and non-event days), nearly half of the visitors said that they were going to other event (public) places or a downtown restaurant. When the sample was divided into event and non-event days, a majority of the responses were "work" on non-event day mornings and afternoons.



This percentage almost dropped to zero by the evening and the responses were equally divided between "nowhere" and restaurant or other entertainment places. This shows that almost 40 percent of the people are visiting other places in downtown after their work. Only 3 percent of the sample expressed the intention of going to the river's edge on a non-event day.

On an event day, a larger percentage of respondents expressed their desire to visit restaurants and other public places (event locations). In the evening, the trend was very similar to that of a non-event day. That is, almost 40 percent of the people stated that they were going nowhere else. In general on an event day, approximately one out of ten respondents expressed their desire to go to the riverfront as opposed to almost zero percent on a week day.

Other downtown destinations: Time period differences      A look at the visitors' other downtown destinations by time period shows a substantial range in the percentage of people reporting their willingness to go to other downtown destinations. On a non-event day, a majority of the people were going nowhere else except to work. On the other hand, on an event day 64 percent of the respondents intended to visit other downtown areas and restaurants. These responses were consistent for mornings and afternoon time periods. However, 44 percent of the visitors contacted in the evening went nowhere else in the downtown.

In general, the time period where most of the visitors stated their desire of visiting other places with the prospect of spending money was lunchtime on an event day. On the other hand, shopping--one of the most important money spending areas--was very low on event and non-event days.

**Summary** Most of the visitors who were attracted downtown also visited other downtown destinations on both event and non-event days. However, a substantial portion of them indicated that they would be going nowhere else in the evening.

While the goal of people visiting other downtown destinations is being met, it is very discouraging that only a limited percentage of respondents would be going to places such as shopping areas where money is likely to be spent.

Finally, one of the most important tasks of this research was to see whether people were visiting the riverfront. The results were very discouraging. Almost zero percent of the sample expressed the desire to visit the riverfront on a week-day. This situation improved slightly on an event day. However, this was the last priority of the respondents.

**Conclusions** First of all, it is very clear that more people are attracted to downtown when entertainment and special events are provided. Activities sponsored on the river such as Two Rivers Festival drew visitors to the riverfront to watch boat races and also attracted people with the installation of temporary vendors for food.

Live performances in Nollen Plaza, for example, attracted office workers especially during lunch time on a weekday. Also visitors were specifically attracted to Nollen Plaza during weekends on special event days such as Summer Fest 1989. Almost 40 percent (majority) of the people stated that their primary reason for their visit was to work on a week-day. This clearly illustrates that there is a need to provide different kinds of activities to attract people to downtown.

## 2. The riverfronts contribution to the amount of time people spend downtown

Frequency of visits In the questionnaire, respondents were asked about the frequency of their visits to downtown. Table 7 clearly illustrates that more than 60 percent of the respondents on both event and non-event days are familiar with the downtown and visited more than five times in previous year. However, it is interesting to note that the percentage of people who claimed that this was their first visit to downtown is very low (6 percent) on an event day as opposed to a non-event day (16 percent). These figures are consistent throughout the day at different time periods.

Table 7. Visitors' frequency of visit to downtown

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Never	1	1	1	3	4	2
1-2 times	1	1	1	1	1	3
3-5 times	3	6	5	3	4	3
> 5 times	11	17	17	12	12	15
Total	16	25	24	19	21	23

This evidence clearly illustrates that the new visitors are not attracted to downtown both on event days and non-event days (especially on event days). In short, a large group of visitors who had been to downtown before are being attracted.

Time period of previous visit With the intention of understanding when people were in downtown on their previous visit, users were asked what days and what times of the day they had visited downtown during their previous visit. Table 8 shows the responses on event and non-event days.

Table 8. Visitors' previous visit to downtown

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Morning	1	3	2	0	0	2
Noon	0	0	1	3	6	2
Evening	2	3	2	4	1	7
Weekday	7	8	12	7	7	6
Weekend	3	8	2	4	4	4
Event day	3	3	5	1	3	2
Total	16	25	24	19	21	23

Weekday visits were fairly high on both event and non-event days. On an average, 40 percent of the visitors said they came to downtown on a weekday. Approximately 20 percent responded that their previous visit was on a weekend and around 10 percent (on the average) stated their previous visit was on an event day.

When we take a look at different time periods within a day, the lowest level of reported downtown visits was during the morning time period. The largest number of people said they visited downtown during afternoons and evenings with a maximum number of visitors in the afternoon (lunchtime) on a week day. It is likely that most of the people came to downtown for work or to take care of some official business. It is

also interesting to note that the most intensive period of reported visits was lunchtime and evenings on a weekday.

Duration of visit In addition to looking at the frequency of visits and different time periods of their previous visits, it is very informative to look at the duration of visits as an indication of downtown's ability to contribute to people spending more time downtown. Users were asked as to how long they would be in downtown. Table 9 shows their responses.

Table 9. Visitors' duration of stay in downtown

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
< 1 hour	0	0	6	4	5	10
1-2 hours	2	6	12	4	4	7
2-3 hours	4	7	4	3	2	1
3 > hours	6	8	0	7	8	4
Don't know	4	4	2	1	2	1
Total	16	25	24	19	21	23

The duration of visit varies on event and non-event days. The maximum time spent in downtown on an event day was 1-2 hours. On a non-event day, two extreme responses were recorded equally, i.e., 30 percent of the people stated their visit as less than an hour and 30 percent stated as more than three hours.

In examining the amount of time spent during the different time periods, the following differences exist. In the morning hours, the maximum number of people (38

percent) stated their duration of visit as more than 3 hours. This is true both on event and non-event days. This trend gradually decreased as the day passed and by the evening the duration of stay dropped to 1-2 hours on an event day. In contrast, on a non-event day, a majority of the respondents (44 percent) stated their duration of stay as less than an hour. This clearly illustrates that the majority of people was going "nowhere" or spending less than an hour in downtown after office hours on a weekday. Visitors stayed longer in the evening on event days than non-event days.

Visitors' group type and size To understand more about people spending time downtown, visitors were asked if they came alone or with others to downtown. On an average one-fourth (25 percent) of the visitors came alone to downtown on both event and non-event days. The other three-fourths (75 percent) came with someone else. If we take a look at event and non-event days separately, only 15 percent of the visitors came alone on an event day as compared to 35 percent on a non-event day. Among others who came with someone else, on an average 70 percent of the visitors came with families and 18 percent with friends. Only 12 percent came with both family and friends. The number of families remained constant for both event and non-event days. However, the number of people who came with friends was reduced on event days as compared to non-event days. Table 10 describes the user responses.

Table 10. Visitors' group type

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Family	12	14	13	6	9	13
Friends	1	2	3	5	5	1
Both	2	6	2	1	0	1
Alone	1	3	6	7	7	8
Total	16	25	24	19	21	23

Looking at these time periods, almost 8 out of 10 people said they came with families in the morning and evening time periods. This is reduced to 60 percent by the afternoon. However, a majority of the people who visited in the afternoon came alone on a non-event day (mostly lunchtime office workers). The percentage of people who came with both families and friends is very limited on all days except on event day afternoons where it increased to 27 percent.

Visitors' group size In addition to learning about whether people visit downtown alone or with families and (or) friends, it is helpful to know the size of the group visiting downtown. Table 11 shows the visitor responses of who visited alone or in groups of two, three, four and above.

Table 11. Visitors' group size

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
One other	4	5	4	5	6	9
Two-three	6	9	7	7	8	6
Four-ten	4	8	7	0	0	0
> ten	1	0	0	0	0	0
Single	1	3	6	7	7	8
Total	16	25	24	19	21	23

On an average, approximately 35 percent of the visitors on a non-event day came alone to downtown. This was more than twice the percentage of single visitors on event days. Overall, the most dominant groupings were of 3-4 people on event and non-event days.

When we look at the different time periods, the highest percentage of people visiting downtown alone came on a non-event day (weekday) afternoons. The number of visitors coming with one other person is consistent throughout the different time periods and a group of 4 to 10 others is almost negligible on a weekday, which increased to almost 30 percent on an event day. This distribution is also consistent at different time periods. The sample does not show any evidence of a larger group of more than 10 people.

A look at the overall size of the visitor groups shows that one-fourth of the visitors came alone, and about the same size came with one other person. Most of the respondents said they came with four or more people. Visitors came with friends and



with their families. Event days and non-event days attracted an equal number of families. Non-event days attracted more friends as compared to event days. However, a combination of both family and friends were attracted more on an event day than on a non-event day. Event days also brought more of large groups of people. Most people who came alone visited on weekday afternoons (lunchtime office workers).

Downtown is a good place to bring friends It was an assumption that the riverfront should attract a variety of users. As described in the previous section, most of the groups attracted to downtown were bringing families. To determine whether the downtown is a good place to bring friends, they were asked if they felt the same. Table 12 shows the visitor responses.

Table 12. Downtown is a good place to visit: Level of agreement

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	16	21	22	14	17	11
Agree somewhat	0	3	2	5	2	9
Disagree	0	0	0	0	1	0
Don't know	0	1	0	0	1	3
Total	16	25	24	19	21	23

On an average, eight out of ten visitors felt strongly that it was a good place to bring friends. Responses to this question did not vary significantly between event and non-event days except on a non-event day evening where the response rate was reduced

to 48 percent. Though many people were not coming with friends to downtown as we have seen in the last section, a majority of the people agreed strongly that the downtown was a good place to bring friends.

Conclusions In general at different public places in downtown where the surveys were conducted, it is well established that the people are spending time at various public places both on event and non-event days.

Large groups of people who had been to downtown before are dominant throughout the survey including both event and non-event days. This evidence clearly illustrates that the new visitors are not attracted much to downtown. Also a majority of the people stated their previous visit was on a weekday. This may lead to the conclusion that most of the visitors came to downtown for work or to take care of some official business. It is also established that visitors stayed longer on event days than non-event days. On special event day afternoons and evenings visitors stayed longest, an average of 2 to 3 hours. It is also evident that a majority of the people went nowhere or spent less than an hour on a weekday. When we looked at the type and size of the group, families were the dominating groups on both event and non-event days. However, majority of people who visited in the afternoon came alone on a weekday (mostly lunchtime office workers). The percentage of people who came with both family and friends was throughout very limited except on event day afternoons. It is also very clear that almost 75 percent of the people who visited came with some one else.

Finally, people said that the downtown was a good place to bring friends, and they usually came with three or four others. This information leads to the conclusion

that when the riverfront is being developed it may bring many people to the riverfront location, thus providing the amenity which will contribute people spending more time with family and friends.

### 3. The riverfront's provision of diversity of experience and activities

It was the intention that the riverfront development should provide a diversity of activities to the user needs. It was also assumed that the riverfront should provide a calm and quiet places for the users who are willing to get away from the hot city sidewalks or busy offices. At the same time one should be able to visit the riverfront alone, with a group of friends, or to meet a favorite person for lunch.

Downtown as a restful place In an attempt to understand how visitors feel about the place, users were asked whether the place was restful. Table 13 shows the responses on both event and non-event days.

Table 13. Visitors' agreeing the place was restful

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	6	11	13	16	15	20
Agree somewhat	6	9	9	3	5	3
Disagree	3	4	2	0	1	0
Don't know	1	1	0	0	0	0
Total	16	25	24	19	21	23

Nearly two-thirds of the users agreed strongly that the downtown public places were restful. When the users were asked what they liked best about the place, "quiet," "peaceful," and similar descriptions were mentioned twice as often on the riverfront than other surrounding public places. It is also evident from the survey that almost twice the number of visitors on non-event days mentioned "quiet" as an attribute they liked best as opposed to event days. When we examine the responses at different time periods, the number of people who agreed strongly remained dominant throughout the day on a non-event day and the response level was reduced to almost half of that on an event day.

In summary, a sufficient portion of visitors at different public places found them to be relaxing and peaceful places. Twice as many visitors note "quiet" aspects of the riverfront on non-event days as on event days. Only a negligible percentage of people disagreed or did not know whether the place was restful.

Crowding in downtown Another measure of the degree of restfulness is to look at how "crowded" the users feel in different public places in downtown. Table 14 represents how the users felt when questioned whether they agreed the place was crowded.

On an average, 60 percent of the visitors felt the place was not crowded. Generally, the users agreed somewhat, or disagreed in most of the cases, and only 6 percent of the people agreed strongly that the place was crowded.

Table 14. Users agreeing downtown public places were crowded

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	3	4	1	0	0	0
Agree somewhat	10	10	8	5	8	4
Disagree	3	11	15	14	13	19
Don't know	0	0	0	0	0	0
Total	16	25	24	19	21	23

Looking at feelings of crowding on event and non-event days, the percentage of visitors agreeing somewhat that crowding is higher on an event day. This percentage, however, reduced gradually from morning to evening. On a non-event day, a majority of people (72 percent) claimed the place was not crowded and this remained almost the same throughout the day.

Downtown as an activity center It was assumed that some users would visit downtown because there would be lots to do. The riverfront when developed would attract people as an active downtown center and would be a fun place to visit.

To determine the extent to which the visitors felt this way, users were asked the extent to which they agreed the downtown could be described as "fun to visit". Table 15 shows the extent of this agreement at different time periods on event and non-event days.

Table 15. Users agreeing downtown was fun to visit

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	14	20	17	15	12	14
Agree somewhat	1	5	6	3	7	9
Disagree	1	0	1	1	0	0
Don't know	0	0	0	0	2	0
Total	16	25	24	19	21	23

On an average, 72 percent of the visitors agreed strongly that the place was fun, and only 4 percent of the people disagreed. More visitors in the morning expressed strong agreement that the place was fun than at any other time of the day. It is very discouraging to note that a relatively low percentage of people agreed strongly that the place was fun on a non-event day afternoon which happens to be lunchtime for office workers. Also at the same time period, a majority of the people disagreed that the place was fun. It is also interesting to note that the hesitation of agreeing that the place was fun to visit has increased gradually from morning to evening.

In addition, the visitors were asked if they agreed there was a lot to do downtown. On an average (both event and non-event days), 28 percent agreed strongly that there was a lot to do, 20 percent disagreed with the feeling there was not a lot to do. Table 16 shows how these responses varied on event and non-event days.

Table 16. Users agreeing that there was lots to do in downtown

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	10	9	8	5	1	3
Agree somewhat	6	14	9	9	14	12
Disagree	0	2	7	3	5	8
Don't know	0	0	0	1	1	0
Total	16	25	24	18	21	23

Except on an event day morning, most of the users at all different time periods only agreed somewhat that there was a lot to do in downtown. It is not very clear but, to a certain extent, people agreed that there was a lot to do on an event day than on a non-event day. It is also interesting to note that, on a weekday at lunchtime, a majority of the people said there was a lot to do in spite of the fact that the same majority (at the same time period) saying that it was not at all fun visiting that place (refer to page 78 of this chapter). Also the number of people who disagreed that there was a lot to do has gradually increased from morning to evening. This corresponds to the same people claiming that the place was not fun.

In summary, at least 70 percent of the visitors felt it was fun to visit downtown. However, when asked if they also felt there was a lot to do, almost two-thirds of them either disagreed that there was much to do or expressed not very strong feelings about the activities available. This tendency may lead to the conclusion that while they like the area on an overall basis, they do not feel enough activities are offered.

Visitors' likes and dislikes A better understanding of the extent to which the downtown provides a diversity of experience and activities is gained also by looking at what people like best about downtown in their visits. It was the assumption that the characteristics derived from the user responses may suggest the type of activities which are attracting them in their decision to visit downtown. It was also hoped that these characteristics may properly be incorporated into the proposed riverfront development.

While the individual responses to an open-ended question concerning what visitors liked best about the place were varied, an effort was made to group certain features which were common in characteristics. The resulting group was then rated depending on the frequency of similar responses. Table 17 represents the users' most frequent responses at different time periods of the day.

Table 17. Characteristics most mentioned by users as what they liked best about the place

Rank	Characteristics
1	Event*
2	Activities
3	Vendors
4	Lunch Break
5	Nicely Designed/Well Maintained
6	Quiet/Restful/Relaxing
7	Fishing

\*Although event was stated by users only on event days, on the whole this topped the list because almost 85 percent of the users on an event day stated their response as an "event", unlike non-event days where responses were diversified.



An examination of the responses on event and non-event days does not show much variation except the most-mentioned characteristic, "the event". When broken down into different time periods, lunchtime users mentioned lunch break first, the activities offered in the area second, and the quiet qualities third. In the morning and evening the area's attractiveness was mentioned first, followed by activities, and then by the quietness and restful qualities of the place.

Behavioral observations Due to the time constraints, organized behavioral observations were not recorded at different time periods. However, general comments were recorded at different time periods while conducting the surveys. These comments suggest a general understanding of how varied the types of behavior were at different public places in downtown.

In Nollen Plaza, the most commonly observed behavior of users was either watching entertainment or observing other people. The plaza was well-programmed on the event day and during lunchtime and evenings on the non-event days. Vendors were very busy especially during the lunchtime and on event days. On a special event day like Summer Fest 1989, the plaza was filled with water and it was a good place for children to paddle in the water.

On the weekend of Two Rivers Festival, for example, boat races were sponsored in the river which drew a lot of spectators to the lawns and riverfront areas. Most of the people were relaxed and found in groups of 5-6 people. The same riverfront location was found totally deserted on a week day.

In summary, there was a variety of behaviors reflecting active and passive types of activities occurring at different public places in downtown. Most of the visitors

watch entertainment because of different concerts and events. In general, there were not many children found in downtown. The study area does not provide any special facilities for children.

Conclusions A considerable portion of the users described the area as restful. However, at lunchtime on a non-event day, relatively low percentage of people agreed strongly that the place was fun. The same time period resulted in the majority of disagreement that the place was fun. It is also interesting to note that the hesitation to agreeing that the place was fun to visit has increased gradually from morning to evening. Also, the percentage of respondents claiming that the place was "crowded" reduced gradually from morning to evening.

When we take a look at the downtown as an activity center, on an average, most of the visitors expressed only lukewarm feelings when asked whether there was a lot to do. It is also interesting to note that at lunchtime, a majority of the people agreed somewhat that there was a lot to do in spite of the same majority of users who at the same time period saying that it was not at all fun visiting that place.

This may lead to the conclusion that while the downtown is providing a diversity of activity areas, visitors frequently expressed the feeling that there should be more to do in that place, especially on weekdays. Also observations of user behavior and the interviews show most people were reluctant to visit the riverfront except when there was some kind of an activity. Out of the people interviewed along the riverfront, almost 90 percent of the users responded that the place was quiet and relaxing to visit.

While different behaviors were observed in separate activity areas, the most observed activity throughout the downtown was watching entertainment. Also the

study area did not provide activity areas which encourage children's play. Less than 5 percent of the observed behaviors involved children playing.

The dual objectives of this goal of wanting the riverfront to be an active city center and at the same time, a quiet and relaxing place were not met to the fullest extent. As far as a quiet and relaxing place is concerned, it was satisfied, but the question of how to make the riverfront an active city center remains unanswered. The findings from these goals will be explored in the next chapter while deciding what activities should be provided along the riverfront.

#### 4. Participant's place of residence: Proximity to riverfront

The demand for housing in downtown Des Moines is strong and growing according to the recent market studies and local developers (Des Moines Plan and Zoning Commission, 1986a). The author assumes that the riverfront development will act as a catalyst in inducing demand for housing in downtown. It was also logical to assume that this new housing demand (if any) will, in return, bring more people to the riverfront and contribute to people spending more time in downtown.

Visitors' place of residence To determine the users place of residence, the responses were divided into four major categories: 1) Downtown, meaning the people who live within 15 minutes walking distance from downtown; 2) Outside downtown but within suburbs; 3) Outside Des Moines but within Iowa; 4) Outside Iowa.

On an average (including both event and non-event days), 77 percent of the users were Des Moines residents. Out of this, 11 percent of the users were downtown residents and the remaining 66 percent lived outside downtown but within suburbs of

Des Moines. Fifteen percent of the users claimed they came from different parts of Iowa, and 8 percent visited from outside the state.

Visitors' place of residence: Event and non-event days Table 18 describes the users' place of residence on both event and non-event days and at different time periods of the day.

Table 18. Visitors' place of residence

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Downtown	1	2	3	2	1	5
Suburbs	10	15	16	12	16	15
Outside DSM						
but in IA	4	5	3	2	4	2
Outside IA	1	3	2	3	0	1
Total	16	25	24	19	21	23

On a non-event day, most of the users were Des Moines residents than on an event day. The visitors coming from outside Des Moines, meaning the people coming from different parts of Iowa, and also from outside the state, increased by 30 percent on an event day. However, it is interesting to note that the percentage of downtown residents reduced almost 40 percent on an event day as opposed to a non-event day.

Visitors' place of residence: Time period difference Looking at the different time periods of the day, downtown residents was reduced to almost half on an event

day morning as compared to non-event day morning. This trend, however, improved by the afternoon and again dropped by the evening. It is very encouraging to note that 22 percent of the visitors were downtown residents on weekday (non-event day) evenings which is almost double the average of downtown residents at any other time periods of the day.

People who were visiting from different parts of Iowa increased to more than double on an event day morning as opposed to a non-event day morning. This trend, however, is reversed by the evening.

Conclusions In general downtown attracted people from a variety of geographic areas. A majority of the people were attracted from the metropolitan area and Des Moines suburbs. On an average, 11 percent of the downtown residents were attracted to various public places in downtown.

According to the 1980 U.S. Census data, only 1.6 percent of the population are residing in downtown. However, according to the survey, 11 percent of the visitors were downtown residents. These figures seemed to be unrealistic, but downtown Des Moines is changing; population and employment are expanding rapidly. Since 1980, approximately 800 new housing units have been constructed in downtown and a substantial amount of public improvement projects have been undertaken in downtown to induce higher demand for housing. Table 19 shows some of the major downtown projects completed since 1980.

Table 19. Major downtown housing projects completed since 1980

Project	Location	Details
<b>The Plaza</b> Project completion winter 1985	4th and Walnut	<ul style="list-style-type: none"> <li>- 214 condominium units</li> <li>- 25 story building</li> <li>- 250 parking spaces</li> <li>- 63,000 sft. of comm. space</li> <li>- Connected to skywalk</li> <li>- Urban Renewal offering</li> </ul>
<b>Lugutti Tower</b> Project completion winter 1986	SE corner of 5th and Keo	<ul style="list-style-type: none"> <li>- 139 rental units</li> <li>- 13 levels: Located above 8 levels of parking</li> <li>- Connected to skywalk</li> <li>- HUD 202 project</li> </ul>
<b>Park Place</b> Project completion Fall 1986	NE of 7th and Park Streets	<ul style="list-style-type: none"> <li>- 142 rental units</li> <li>- 16 story building</li> <li>- Senior citizen/handicapped</li> <li>- 3.5 levels of parking</li> <li>- HoDAG</li> </ul>
<b>Elsie Mason</b> Project completion 1981	SE of 5th and Grand Avenue	<ul style="list-style-type: none"> <li>- 150 rental units</li> <li>- Senior citizen/handicapped</li> <li>- 50 parking spaces</li> <li>- Connected to skywalk</li> <li>- HUD 202 project</li> </ul>
<b>Civic Center Courts</b> Project completion 1982	Between 2 and 3rd on Grand Avenue	<ul style="list-style-type: none"> <li>- 140 rental units</li> <li>- Efficiencies and 1 bed room</li> <li>- 3 story building</li> <li>- Urban Renewal offering</li> </ul>

Source: Des Moines Plan and Zoning Commission, 1986a:6.

In addition, a Des Moines Convention Center and major new hotels have been built insuring that the downtown hosts a large number of persons after five p.m. Apart from this new construction, a lot of housing units have also been added through the rehabilitation of the upper levels of commercial buildings on the eastern and western edges of the downtown (Des Moines Plan and Zoning Commission, 1986a:5-6). A well integrated skyway system and the city's aggressive steps in promoting different programming activities are encouraging downtown residents to spend more time in various public places.

Considering all the facts, it is not very surprising to note that almost 11 percent of the downtown residents are using these public places at different time periods. It may also be concluded that more housing will be built and that the demand will mushroom as more amenities and conveniences are developed along the riverfront.

The major focus of this section was to see how the downtown residents are using various public places in downtown and how the proposed riverfront development would attract more people to the river's edge.

From the survey results it is evident that, though the number of downtown residents is increasing, it is not very clear that these spaces are being utilized properly. For example, the percentage of downtown residents has been reduced to almost 40 percent on an event day as compared to a non-event day. This trend, however, did not remain constant throughout the day. It improved by the afternoon and again dropped by the evening. In contrast, on a weekday evening, for example, the percentage of downtown residents has increased to 22 percent which is almost double the average number of downtown residents at any other time period. There are various reasons for these fluctuations and these problems will be explored in the next chapter in an attempt

to integrate the proposed riverfront development with the existing and the proposed downtown housing.

##### **5. Participants' feelings about functioning of various public places in downtown**

In any type of development, it is very important to look at the issues of security, maintenance, accessibility, and the visitors' likes and dislikes. These issues help a designer to resolve problems through proper designing. It is believed that visitors must feel they should be safe in downtown before making a decision to visit the area. It is also important to note that the sample may not be very accurate since the people who feel that the downtown area is not safe would not visit and would not, therefore, be available for the sample.

**Security** Users were asked as to the extent to which they feel downtown is a safe place to visit. Table 20 describes the responses from the survey.

Table 20. Users agreeing downtown is safe to visit

	Event Day			Non-Event Day		
	Morning	Noon	Evening	Morning	Noon	Evening
Agree strongly	15	23	11	16	16	9
Agree somewhat	0	1	10	0	2	11
Disagree	1	1	3	2	2	2
Don't know	0	0	0	1	1	1
Total	16	25	24	19	21	23



Overall, on an average 7 out of 10 people agreed strongly that the downtown was safe to visit. The remaining 30 percent of the users agreed somewhat or disagreed that the downtown was a safe place. When compared with surveys conducted only on the riverfront, almost 50 percent of the people disagreed that it was a safe place to visit.

Looking at the issue of security separately on event and non-event days, the data do not show much of a difference. However, when we break it up into different time periods, the percentage of people who reported that they did not feel safe increased significantly by the evening time period.

While it is evident that fewer visitors feel safe on the riverfront as compared to other downtown places, the reasons are difficult to determine. One of the obvious reasons was that during all time periods, there were fewer people on the riverfront than other places. It was also observed that a relatively lower percentage of users said that the riverfront was unsafe on an event day as compared to other days. To determine the reason, an effort was made to crosstabulate the safety issue with the user group sizes. It was found that larger group sizes were dominating on an event day as opposed to other days. These observations may lead to the conclusion that larger group sizes are probably making the users feel more safe.

In an attempt to understand what visitors feel about security at different time periods (i.e., to understand the visitors' perception of safety at different time periods of the day), users were asked once again whether he/she would feel the same at different time periods. When compared the two results, i.e., the visitors who actually visited the riverfront and the visitors who imagined how it would be to visit at different time periods, the results were surprisingly different, especially in the evening. The majority

of the visitors who perceived how it would be in the evenings claimed to be unsafe than the number of people who actually were on the riverfront at the same time period. This evidence leads to the conclusion that a lack of positive images about the riverfront is making the users perceive that it was not a safe place to visit.

### **Major Findings and Their Implications on the Proposed Plan**

Throughout the examination of data gathered in the user surveys and observations, it was learned that the neighboring public places along the riverfront are somewhat successful in meeting the defined objectives. However, there are areas where improvements could be made. It was assumed that the existing activity patterns would likely to be dictating the proposed riverfront plan. An understanding of the assets and "misfits" might apply to riverfront policy planning and to specific design issues. These implications also might suggest the improvement of the operation of the existing downtown public places to better coordinate with the proposed development.

First, it is clear that more people are attracted to the riverfront when entertainment is provided. Activities sponsored on the river, such as the Two Rivers Festival, drew visitors to the riverfront. Live performances in Nollen Plaza, for example, were very popular for lunchtime office workers.

If the riverfront provides facilities to accommodate events and activities to attract visitors, then the event facilities must be designed to fit the needs of the audience and performers. Otherwise, there will be a "misfit" between the event facility and the needs of the audience. Comfortable seating and shade trees are very important to event viewers.

The study also showed that only one out of ten users was a first-time visitor on weekdays. It was also observed that these public places are not utilized properly at non-peak hours. An effort should be made to promote activity programming during less intense use periods to attract more people to the riverfront at non-peak hours.

The results of the survey did not reveal the evidence that the downtown users are visiting shopping and other commercial areas where money is likely to be spent. The riverfront is one of the prime locations for shopping and other money spending events. However, the existing riverfront is separated from the rest of the downtown with major physical and visual barriers.

To overcome these barriers, proper linkages between the riverfront and the rest of the downtown need to be encouraged. Special attention should be given in dealing with the edges and entry points to the riverfront and the commercial district. These linkages could probably be achieved in the following ways:

- \* Landscape and other elements on the riverfront (especially at the transitional areas) should lead into the commercial district.
- \* Commercial activity sponsored by the downtown merchants could extend into the riverfront plazas either in the form of small vendor areas or through promotional material and advertisement.
- \* Specialty seafood restaurants would also attract visitors to the riverfront.

The dual objectives of wanting the riverfront to be an active city center and, at the same time, a quiet and relaxing place to get away from the busy city streets is achieved to varying degrees. It is well established that the users feel the riverfront is a quiet and relaxing place. There is, however, no evidence for the riverfront to be an active city center. It is also evident that the surrounding public places were attractive

and fun to visit, but often people said there was not much to do. While different behaviors were observed in separate activity centers, the most common activity throughout the downtown was watching entertainment. It is also clear that most of these places did not provide any activity which encourage children's play areas.

To meet the dual objectives of the riverfront being an active city center and at the same time being a quiet place to escape from the crowded city life, the park design should separate and buffer activity areas. This could be done by providing more active areas near the core (between Court Avenue and Grand Avenue), and reducing the intensity of activities as one goes further away from the downtown core through passive oriented spaces. The activity area near the commercial core would also serve as a place for lunchtime office workers.

The selection and placement of surface treatments can also have an impact on how visitors characterize the place. Grassy areas and soft surfaces with trees and views of the water are described as relaxing and quiet places by the users. Hard surface areas like Nollen Plaza for example, were often described by the users as active areas.

As mentioned earlier, there are no facilities available in the downtown for children's play. This was also reflected in the sample especially on a weekday where it was difficult to locate a person under eighteen years old. Facilities for the children's play which are unique in the city's park system should be incorporated in the proposed development. Also, it is suggested that these facilities should be close to adult activities, so parents will not be forced to be separated from the riverfront attractions to observe their children at play.

Finally, the commercial activity is an attractive element which could contribute to the experiential diversity of the riverfront. Many visitors said they would like to have vendors operating on weekdays, especially during lunchtime.

It was an assumption that the riverfront development will act as a catalyst in inducing demand for housing in downtown. It was also assumed that this new demand (if any) would in return bring more people onto the riverfront.

As mentioned earlier, a relatively large population of downtown residents is using these downtown public places. It was also established that the proposed development would become a downtown public amenity for the developers as a marketing tool in inducing more demand for downtown housing.

It is evident from the survey that, the downtown residents are using these public places up to the expectations, however, there is a lot of fluctuation in their use during different time periods. Proper care should be taken to integrate these proposals with the new residential development. As mentioned earlier, the children's play areas could be incorporated closer to the residential units.

When we examine the issues such as security, accessibility, maintenance, and user likes and dislikes, there is considerable contrast between riverfront areas and other public places in downtown.

First, it was noted that most of the users who feel the riverfront area is not safe would not visit, and would not, therefore, be available for the sample for questions about feelings of security. However, almost 50 percent of the users said the riverfront was not a safe place to visit. The same question was asked again to know how users would feel at different time periods. A majority of the visitors who perceived how the place would be to visit at night said it would be unsafe as opposed to the people who

were actually on the riverfront at the same time period. This implies that a lack of positive images about the riverfront is influencing people not to visit the place at nighttime.

It is very important to change this negative image before any further development is considered. This could be achieved through the promotion of frequent festivals and public gatherings along the riverfront to encourage the users to come to the riverfront areas. This situation could also be alleviated through the new housing demand.

For a majority of the people, accessibility was not a major problem in reaching downtown destinations. It is also clear that a majority of the people are using automobiles to reach downtown, but most of them are then walking to these public places. The bike trails and walkways along the riverfront are being utilized heavily in the morning and evening time periods. However, they are not continuous throughout the riverfront. It is important to extend these pathways to connect different activity nodes throughout the riverfront.

According to the survey results, parking is not much of a problem for the visitors; however, the results may not be reliable based on size of the sample. As mentioned earlier most of the people, though using cars to reach downtown, are walking to these public places and thus it is likely that the exploration of this conclusion might be inaccurate in view of an expanded user-base. Also, currently most of the riverfront is occupied by parking lots and it was the assumption that these parking lots are underutilized and not consistent with the proposed development. Therefore, it is important to conduct further studies to determine the relocation of these parking lots. However, this needs to be studied separately as it is beyond the scope of

this thesis.

Overall, a majority of the users agreed strongly that the downtown public places are well maintained and it is assumed that the city would continue to maintain these places in the future. Since the thesis also assumes that the new development would be carried out on the basis of public/private partnership, the city should make efforts to coordinate with the private developers in maintaining the riverfront.

Finally, when we take a look at the user likes and dislikes, events and the activities sponsored at different public places are clearly attracting the users. It was also observed that vending areas were most popular on event days. Visitors also expressed their concern of not having many good places to eat on weekdays (especially during the lunchtime). On the riverfront, most often users liked the quiet and relaxing qualities of the place. However, most of the users expressed their concern about the quality of water. Users also preferred to have more activities on the riverfront.

It is obvious that the levee walls (physical barriers) and the lack of visual and physical access to the riverfront is causing the users to dislike the riverfront. It is also very clear from the survey that the riverfront was the last priority in their visit to downtown.

In summary, the findings and their implications on the proposed development plan suggest that the stated objectives are being met to a large extent in various public places downtown. However, when it comes to the riverfront, users are expressing totally contrasting attitudes. It is hoped that these implications suggest certain guiding principles in the process of developing a conceptual plan for the riverfront which will be further explored in the next chapter.

## **CHAPTER 6. PLANNING OBJECTIVES AND GUIDING PRINCIPLES**

### **Concept Development**

The study started with the basic assumption that the Des Moines downtown, and the riverfront areas are underused after the end of the normal business hours. This caused the area to feel deserted and unsafe for many residents of Des Moines and for most visitors of the city. With this assumption in mind, two major areas were explored in the preceding chapters:

Chapter 3: Historical background of Des Moines Riverfront.

Chapter 5: Present situation and the visitor responses to these issues at different public places in downtown including the riverfront areas.

From the analysis it is very clear that, historically, downtown was dominated by the resident population till 1960s. However the situation has changed since then because of the urban renewal in the 1960s when most of the residential areas were removed from the downtown locations. Suburbanization also allowed people to move away from the city centers. As the downtown redeveloped, it became primarily an office and retail center. A large number of shopping areas, services, and types of entertainment moved out of the core with the removal of the resident population.

The riverfront has always been an integral part of Des Moines and Raccoon rivers. The city originated at the junction of these two rivers where Fort Des Moines



was located. Currently this point of land has no trace of historical significance. In general, the history of Des Moines has been lost to the general population of the city. The City Beautiful Movement landscape elements are the other major continuous features of the riverfront. In some places, the Court Avenue District, Court Avenue Bridge, the Balustrade, the Civic Center Historic Buildings, for example, retained the city's historic character. However, in most of the places, these historical elements are missing or about to deteriorate completely. The first part of the analysis was to identify ways to integrate these historical trends and the historical landscape elements into the proposed development.

The second part of the analysis was concentrated on the need for evaluation research in the area of public oriented spaces on the riverfront and other surrounding public places in downtown. This was done through personal interviews conducted by the author at different time periods of the day on both event and non-event days. The intention of the survey was to understand how these public places are currently in use and operation and their implications on the proposed riverfront development. The basis for this, is the assumption that the surrounding public places would likely to be dictating the type of development needed for the proposed development plan.

## **Objectives**

Based on the historical analysis and the survey results, the following objectives have been derived for the conceptual development plan.

1. To activate the riverfront with exciting and new activity points.
2. To link these activity points with each other and with the surrounding public places.

3. To create and strengthen links perpendicular to the river to relate the commercial core (west side) and the State Capitol (east side).
4. To interpret the history of Des Moines.
5. To bring back the resident population into downtown.
6. To create a sense of security along the riverfront.
7. To create spaces such that the riverfront becomes an active city center and, at the same time, a quiet and relaxing place for people to get away from the crowded city.
8. To retain the character of the historical buildings and incorporate a proper relationship between the buildings.
9. To maintain view corridors to and from the riverfront.
10. To allow a mix of zoning uses along the river to reduce the monotony of single-use districts.
11. To eliminate any under-utilized lands along the riverfront and propose more productive functions.
12. To propose the development to be carried out on the basis of public/private partnership.

### **Assumptions**

It is very important at this stage to make certain assumptions on which the proposed plan should be developed. These are described below:

1. Some of the existing land uses within the study area such as Iowa Power Plant, and parking lots near Armory and Federal Court House buildings are inconsistent with the riverfront setting and it is assumed that the appropriate development of these areas could maximize the potential use of the riverfront.
2. It is assumed that efforts will be made in the future to improve the quality of water in the Des Moines and Raccoon Rivers.

3. It is further assumed that engineering studies will be conducted to determine the feasibility of removing (or relocating) the existing dams in order to encourage boating activities on the river.
4. The thesis would also assume that some minor alterations of the river banks and the existing levees are necessary.
5. Eventually the existing skywalk system would be extended to the riverfront (and possibly to the east side) linking the pedestrian movements at major nodes.
6. Proximity to downtown Des Moines and the State Capitol presents an excellent condition to reinforce its distinct location and function as a physical and visual link.
7. It is also assumed that a public/private partnership arrangement would be very important in the process of developing the riverfront. It is further assumed that the city would first take aggressive steps to promote public-oriented activities (improvements) which would give incentives to the private developers to investing in riverfront projects.

### **Guiding Principles**

In order to arrive at an effective plan for the study area, it is essential to - determine a set of guiding principles upon which the individual nodes of activities would be developed. These principles would derive what type of development and land uses are appropriate for the downtown riverfront. It is important to note that these principles are conceptual in nature. However, there are several ways of expressing these concepts in dealing with individual sites.

### Sensitivity to local history

It is evident from the historical review that many important activities occurred along the riverfront at different time periods since 1800s. It is therefore very important to interpret the historical essence in the proposed development. It was also mentioned that the city originated at the confluence of the Raccoon and Des Moines Rivers and that site should be designated as a landmark representing the history of Des Moines.

### Sensitivity to human scale

A sense of human scale is very important, especially for a project on the riverfront. The needs of the people are extremely diversified and, therefore, it is important to create a kind of environment that has a sense of human scale, which is personal yet draws people together for collective activities. The development would result in spaces where a variety of activities may take place simultaneously and yet give the individual a freedom to behave, to react, to use, to contribute in his/her own way and allow the person to participate in the activities. The landscape elements along the riverfront should also bear human scale qualities and be visually integrated. Also, these landscape elements should reflect the historical character of the city of Des Moines.

### Access to the riverfront

As mentioned earlier, it is evident from the surveys that the riverfront is acting as a "cross-over" point in reaching different public places in downtown. An effort should be made to make it a "stop-over" point rather than being a mere crossing point.

The existing physical barriers (levee walls) are making it difficult for the people to reach the river. Therefore, every new public and private development should add to the system that provides people access to the river.

### Linkages

Strategic nodes and pedestrian paths are considered to be good elements to link various activities proposed by the plan, and special attention must be given at the edges and entry points. The linkages perpendicular to the riverfront are just as important as the ones parallel to the river. It is also important to encourage people to come down to the river; in addition, the development should take advantage of the existing skywalk system to extend on to the riverfront to assure a proper pedestrian circulation system.

### Continuity along the riverfront

The plan should provide a continuous circulation system in order to encourage people to visit different activity nodes along the riverfront. The proposed plan incorporates the existing walkways', bike trails' and steps' access to the water's edge and strengthens these accesses in a coherent system of recreation. This system should run parallel to the river and pass through the different activity nodes.

### Variety of public amenity

A wide variety of amenities and activities are needed to activate the riverfront. It is important to recognize that a person's basic needs stem from his/her basic senses of sight, hearing, smell, taste, touch and instinct. The basis then for any public amenity is that these senses be cultivated, stimulated and satisfied. However, it is

important to note that some activities will be contained within one node while others will spread along the river.

### Imageability of the riverfront

From the survey analysis it is evident that many residents of Des Moines do not have a positive image of the riverfront. There are numerous reasons for this. People cannot see over the levee wall down to the water and therefore the river does not become a landmark in the memory of the residents. It was also observed that large group sizes are making the users feel safe at nighttime. Efforts should be made to overcome this situation by generating more group-oriented activities.

It is also evident that, except on special event days, there is very little celebration of the riverfront as one walks along it. Therefore, it is important to consider locating some tall buildings in some potential sites along the riverfront which will act as vertical markers to serve as orientation points both from the riverfront or from a distance.

### Lighting

This element should be recognized by the plan for both aesthetic and security reasons. In order to change the perception of the riverfront as being the place for crime during the night, the plan should recommend that the riverfront be provided with an adequate lighting system. It should also become the first priority for the city to induce demand for private investment.

**Private investment**

In order to propose a well balanced mixed use development along the riverfront, it is very important to consider that the city should take initiatives not only in providing infrastructure, but also to provide incentives to the private developers in promoting public places along the riverfront. Therefore, the plan should consider a public/private mix of development approaches.

## CHAPTER 7. VISUALIZATION

### Overview

As stated in the methodology, the purpose of this thesis is twofold. The first part of the thesis is to derive guiding principles for the development of the Des Moines riverfront. The second part of the study is to develop a computer based three-dimensional visualization tool. This tool assists an urban designer to evaluate the proposals (derived from the guiding principles) in an existing downtown setting.

The use of computers has almost become a way of life in many professions. Much has been written about the computer and its possible role in architectural practice. Architects use computers (Computer-Aided Design) as a tool to generate and convey ideas of shape, size and construction of architectural design elements. On the other hand, urban planners use computers to perform data processing (including logical and arithmetic calculations, and systematic analyses), data storage and retrieval, and text and graphical presentations.

The extent to which graphics are used in planning oriented projects vary greatly depending on the type of a planning project at hand. These graphic skills are constrained by the limits a planner imposes on his/her visualization of the problem. Three-dimensional models are widely used by physical planners at representational



scales ranging from studies of parts of a building to urban design and city master plans. It is recognized in this thesis that a project like Des Moines riverfront development is more of an urban design scale in nature, and the use of computer graphics as a visualization tool is a most effective and appropriate communication medium.

Simulation/visualization has always been used in architecture and urban design for a long time. Long before the invention of the computer, perspective drawings, architectural models, simple methods of cost computation, project scheduling, etc., have all been techniques for visualization and/or simulation of some aspect of a building to be built. They are used to predict and evaluate its performance. While perspective drawings and architectural models are still quite satisfactory tools for experimentation with form, this thesis proposes an alternative and more efficient tool for an urban designer in achieving the same task.

The proposed visualization tool assists an urban designer to simulate the visual experience of the architectural proposals in an existing downtown setting. To demonstrate the importance of the visualization tool, the proposals (derived from the guiding principles) were selected randomly. The selection of random proposals are based on the assumption that the city receives proposals randomly from prospective developers for review and approval.

The proposed model will further allow to play visual "what if?" situations with the existing database. For example, one of the assumptions of this thesis has been that the existing use of the Des Moines riverfront is dominated by parking lots, Iowa Power Plant, and passive type of open spaces which are underutilized and inconsistent with the Des Moines riverfront. Based on this assumption, if a developer would come up with an alternative proposal, one can easily eliminate (temporarily or permanently)

using the proposed tool the particular graphic element(s) from the database and incorporate the proposals into the database to simulate the alternative use of the site in an existing downtown setting.

Based on the "what if?" situation, a marina was proposed (assumed as a random proposal from a prospective developer) on the Iowa Power Plant site to demonstrate the use of the proposed computer model. Also, a hotel was proposed based on one of the derived guiding principles of locating tall buildings in some potential sites along the riverfront to act as a vertical marker and to serve as an orientation point both from the riverfront or at a distance from it (refer to page 102 of this thesis). These proposals were created separately and the configuration of the marina and hotel proposals were then read into the existing downtown model and added to the database. Using a computer-aided visualization tool, the updated database was then used to generate rendered perspective images on the computer screen. This technique assisted to create an illusion of a realistic image of the proposal in an existing downtown setting.

### **Importance of Visualization**

If insight into this phenomenon of visualization is to be gained, it is necessary to analyze the characteristics of such simulation efforts from a practical point of view. In particular, it is necessary to find out how accurate such simulations tend to be, how practical they are, and what they would cost.

The visualization tool was developed on a set of assumptions and contains a series of simplifying conditions. This was necessary because of the characteristics of software and hardware resources utilized. It is also realized that the proposed tool is

more academic in nature, and the practicality of a similar tool for an urban designer is questionable because of the following economic considerations.

Simulation projects usually take a long time, and the total cost becomes substantial, frequently underestimated. This places an undesirable burden on design firms operating on low marginal profits. Unless the visualization project is funded separately, it considerably reduces the margin of profit for the organization.

Based on these economic constraints, it is felt that the proposed visualization tool may be economically feasible in the city, state, and county level planning agencies, and large urban design oriented firms. This is due to the fact that government agencies and planning commissions deal with different kinds of random proposals from prospective developers on a day-to-day basis, and once the existing database is prepared, it would be very efficient for a designer to incorporate the proposals for the review and approval. It is also evident that, in the process of approval or denial of a particular public oriented project such as the riverfront development, citizen participation at various levels of the project is inevitable. It is obvious that this kind of a visualization tool, capable of more realistic simulation of the proposals, is very helpful for a lay citizen to visually comprehend a proposal.

Finally, what benefits can be expected from this kind of three-dimensional visualization tool in architectural and urban design oriented projects is unanswered. It appears (at least in the authors' opinion) that at this time, development of visualization on computers has definite educational value. Similarly, development of visualization tools by researchers and educators will have immediate value. Future tools will allow many more participants to benefit. It helps to develop a better understanding of how actual visualization systems work, and deficiencies, and inconsistencies in design

solutions are detected. Once the database is ready, it lends itself to quick and efficient investigation of alternative solutions including those which may appear to be prone to risks.

As mentioned earlier, the value of this kind of a visualization tool can be debatable. However, in the recent years large corporations are trying to break into the so called "urban market" by offering computer-aided simulation and visualization services associated with realtime dynamic animation techniques. These corporations tend to embark on simulation projects with the rationale that these advanced capabilities will make them more competitive on the job market. Thus, simulation is becoming an important element in marketing outpacing the question of economic feasibility.

### **Software Description**

Movie.BYU is a general purpose three-dimensional computer graphics software developed at Brigham Young University. This software is used in this thesis to demonstrate the importance of a computer-aided visualization. Movie.BYU facilitates the generation and visualization of line drawings or continuous tone shaded images. The software is available on a time sharing environment on Digital Equipment Corporation's (DEC) VAX computer clusters, VAX mini computers (VMS Operating System) and on Silicon Graphics IRIS workstations (UNIX Operating System) with a 19" high resolution color monitor at Iowa State University.

Movie.BYU is a group of program modules instead of one big program. Thus each module of program performs a specific task. The programs are:

1. Utility: Utility is a data generation and editing program which allows the user to produce and/or edit modules of two and three dimensional polygonal and polyhedral systems.
2. Display: Display is the heart of the system. It allows the display of forms created through utility and other programs mentioned below.
3. Title: Title generates two and three dimensional character strings in a form that is compatible with the display program. The program prompts the user for necessary input and help to create signage.
4. Mosaic: Mosaic is a program that converts complex surfaces defined by contour lines into mosaics of triangular and quadrilateral elements. This assist in the creation of a three-dimensional contour map.
5. Section: Section is a special purpose program for processing three dimensional finite element models. This allows the clipping of polygons against the user specified surfaces which help to "slice" a previously defined group of forms.

Out of the five programs mentioned above, Utility and Display were the two programs used most for the visualization tasks conducted in this thesis. In addition to these programs, "Twist", a locally written software at Iowa State University, was widely used to go along with Movie.BYU. The Twist program allows to change the orientation of a group of forms created through utility.

To better understand Movie.BYU, it is important to understand some of the concepts involved in generating three-dimensional forms. This is explained below mostly through Utility and Display programs.

## Utility

As mentioned before, Utility is a data generating and editing program which allows the user to produce and/or edit models of two or three dimensional polygonal and polyhedral systems. The program allows the user to specify commands to create data files using the model generation and transformation capabilities, to read, write, or change data files, to perform symmetry operations, to gather data into parts for smoothing, to merge or reorganize data files. There are three levels of commands as shown in figure 16.

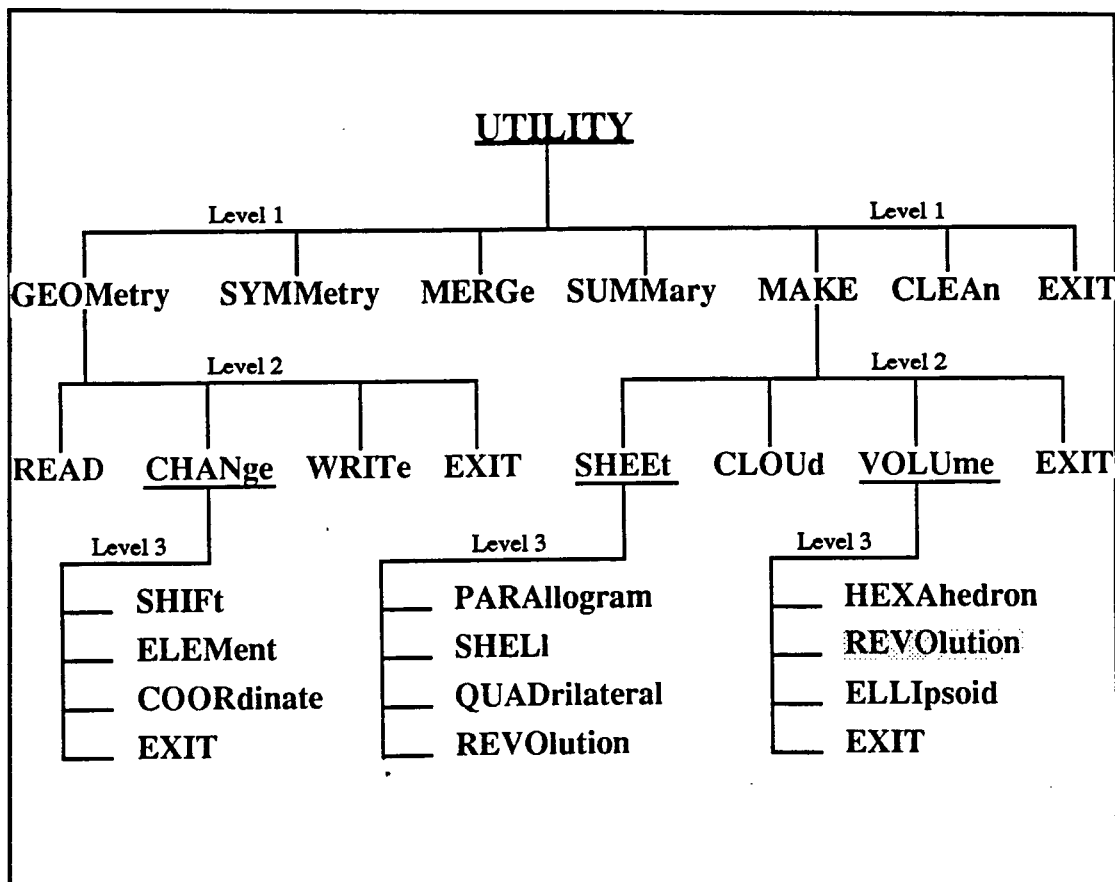


Figure 16. Command structure of Utility program

Concepts To generate any three dimensional geometry in space, the user has to define the form through cartesian (X,Y,Z) coordinates. Thus it may be useful to draw a project on a graph sheet before generating a model using Movie.BYU. As shown in Figure 17 below, to generate a simple cube in space, for example, it needs 8 cartesian coordinates, at a defined position in relation to an origin (0,0,0).

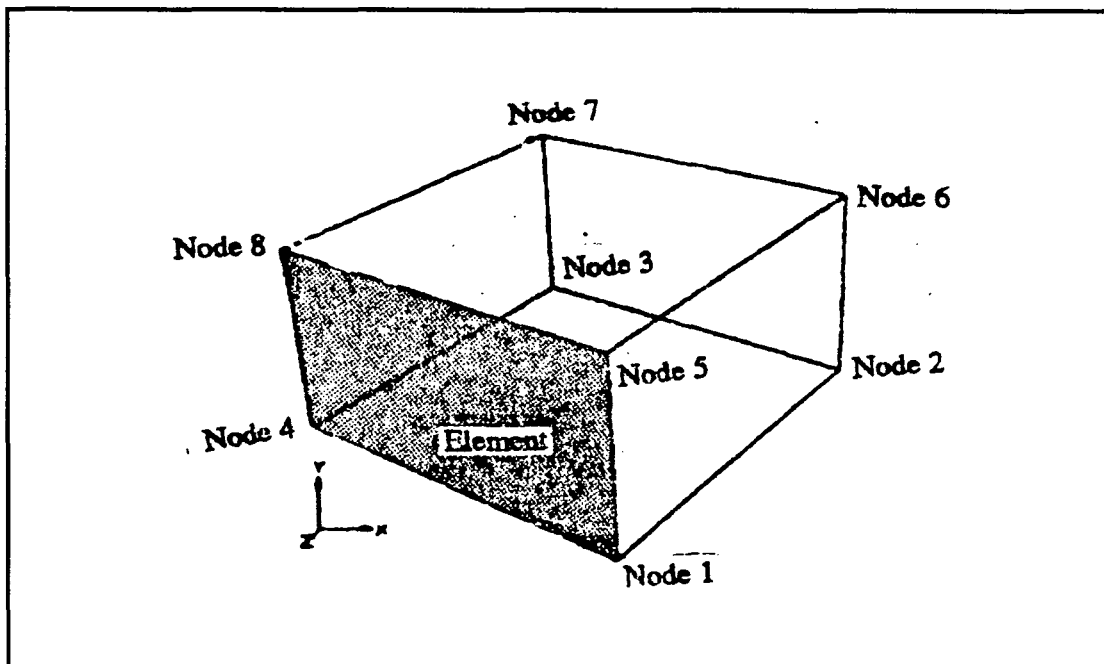


Figure 17. Example of a simple hexahedron

Each coordinate is defined as a "node". Depending on the algorithm defined, these nodes are connected through "elements". A defined geometry created by a group of nodes and elements is represented by a "part". Thus in Figure 17 above there are 8 nodes, 6 elements, and 1 part (a group of parts may also be combined into one part). Based on this general concept different types of three dimensional forms may be created. Figure 18 shows some of the basic forms created using Movie.BYU.

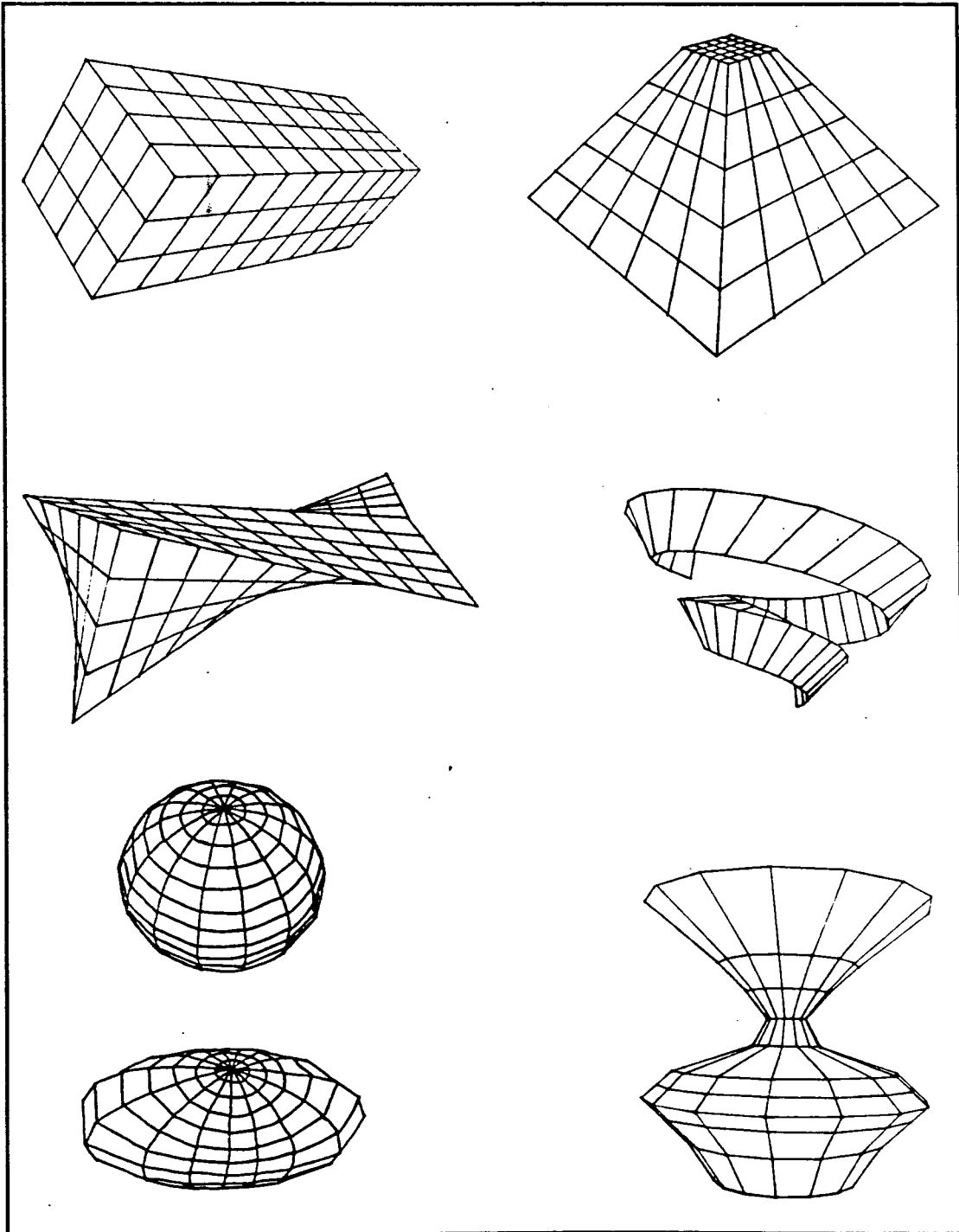


Figure 18. Examples of basic forms created using Movie.BYU software



Data structure The cartesian coordinates of a geometry file include the control variables, the parts array, the coordinate array, and the connectivity array. Figure 19 shows the data structure of a simple hexahedron.

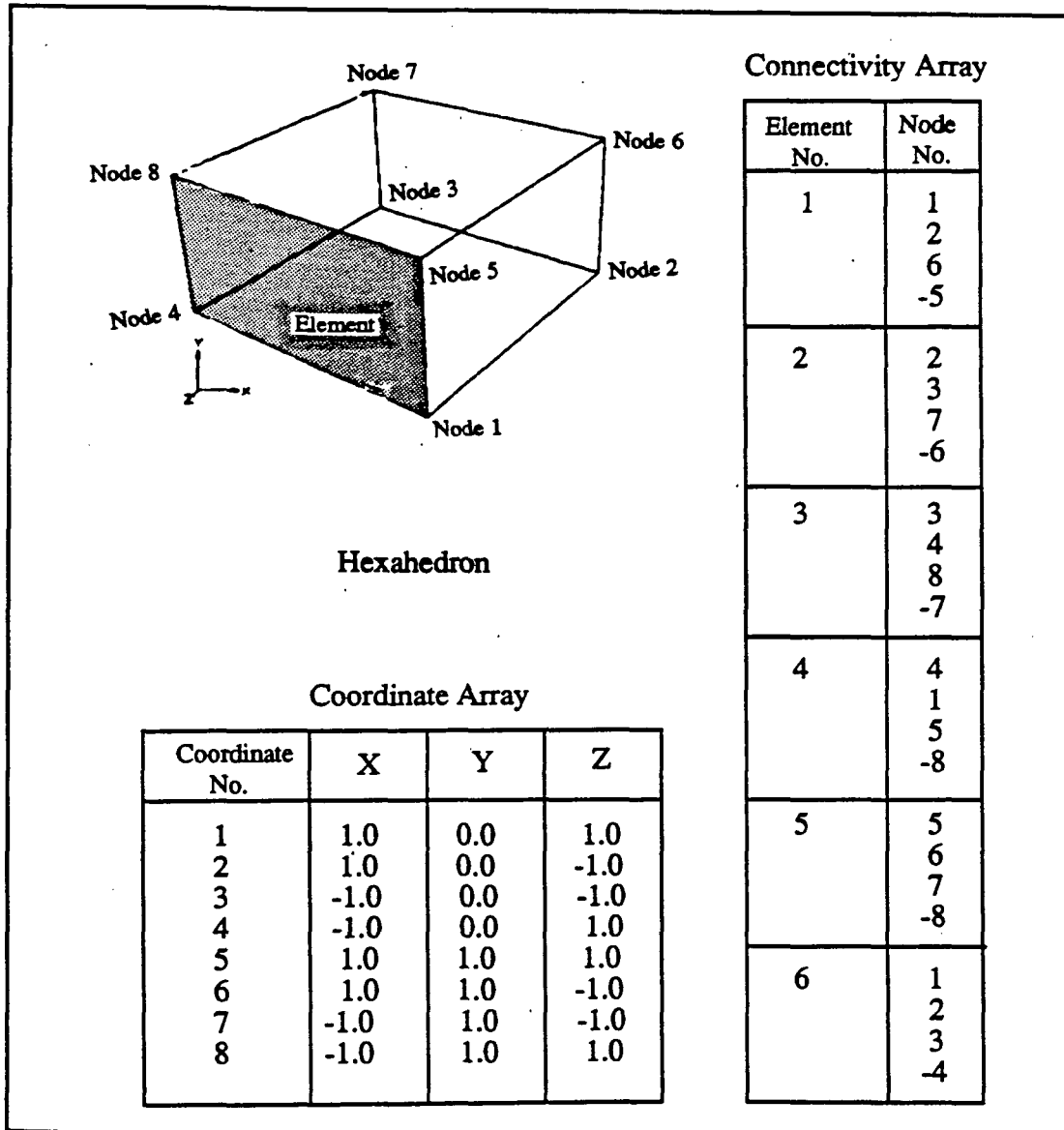


Figure 19. Data structure of a simple hexahedron

The array of coordinates contains the cartesian coordinates of the nodes stored sequentially by node number. The connectivity array contains the node numbers of the elements stored sequentially by element number. The last entry for each polygon is given a negative sign to indicate that all elements are encountered. Figure 19 shows the data structure of a simple hexahedron shown in Figure 17 above (Movie.BYU reference manual, 1983).

A set of elements within the connectivity array may be merged into one part. This option facilitates the organization of the three-dimensional data base in different ways. For example, in the proposed Des Moines model, different parts were merged based on similar heights of individual buildings. In other words, all of the buildings with the same number of floors were merged into one part. This made it easy to assign a specific color (in display program) to all of the buildings of same height to conduct a visual analysis of downtown.

It is also possible to organize the database so as to merge individual parts together on the basis of land uses. This would help in conducting land use studies.

It is further useful sometimes to organize different parts in such a way that the user can temporarily (or permanently) delete a particular part and propose a new building (adding a new part) on a particular site. For example, in this thesis, it was assumed that the Iowa Power Plant is inconsistent with the riverfront. Thus, a marina was proposed in place of Iowa Power Plant. To visualize the marina proposal in the existing model, it was very easy to delete that particular part associated with Iowa Power Plant and to add a new part (or parts) of marina to the existing database.

It is important, however, to recognize that the software has its own limitation on the number of parts to create. This limitation may vary from machine to machine. On

IRIS workstation, where the proposals were generated, a maximum of 100 parts was the limit.

### Display

Display is an interactive program for the display of the geometric forms created using utility and other programs described before. The program allows the user to manipulate the model (rotate, translate, etc.), specify colors for the background and the different parts, and select the display device. However, before manipulating the data it is very important to plan and organize the tasks needed to generate rendered images on the screen.

The first task for the user is a description of individual part numbers that indicate exactly what is desired to generate. This description will also reflect the type of data to be displayed. Is it better to use a shaded image or a wireframe? What color will the different parts be? What rigid body transformations will effectively display the geometry of the model? Should all parts be displayed at all times, or is it better to display only some of the parts? All these questions must be determined before generating three-dimensional views using Movie.BYU.

Concepts The default coordinate system in the Display program assumes the X-axis to be horizontal, the Y-axis to be vertical and the Z-axis pointed towards the observer. To generate a shaded image, color and a light source are very important. By default one light source is provided at the viewers' eye position. In addition, up to 3 light sources may be positioned at either infinity or at any user defined position. The light source represents the color of the object and its general brightness. The color in

Movie.BYU is defined by the relative amounts of red, blue, and green light that it reflects from an element. For example, a blue object will reflect all blue light while absorbing all green and red light. With the same concept, a combination of primary colors will reflect these colored light components on a proportional basis to create a desired color of an object. A minimum value (zero percent) of red, green and blue for example, will generate a black color and a maximum value (100 percent) will produce a white color and proportional values in between will display shades of grey. In addition, the software also lets the user specify highlighting effects on a specific part to give more emphasis on a particular building or an object. However, this is an optional command.

In addition, the program also allows casting of shadows from multiple light sources. Transparency, fog simulation, and anti-aliasing are other options. A detailed description of these options may be obtained from Movie.BYU reference manual.

Along with the capabilities described above, the Movie.BYU software also has the ability to define a sequence of pictures and then animate the sequences. One application of the animation feature is to assist in the production of real time motion picture. The picture sequences may be stored on disk, film, or video tape for playback in real time. A sound track may also be added to narrate the animation sequence. However, the real time animation is dependent on hardware and the size of the data file. The larger the size of the data file, the greater will be the time required to generate an image on the screen negating the illusion of real-time motion picture. Considering the large size of the data file, it was almost impossible for the author to create an animation sequence to visualize the proposals generated using the Movie.BYU software. Hence this was identified as one of the limitations of this study.

Based on these concepts and principles, following are some of the examples presented to demonstrate the use of the proposed visualization tool. These computer images were generated on a 1024 x 1024 resolution (32 bitplane) 19" Silicon Graphics color monitor. The images were then photographed through 35mm film slides and converted into color photo copies.



**Figure 20. Plan view: Existing model of downtown Des Moines**







**Figure 21. A westward aerial view of downtown Des Moines from State Capitol**

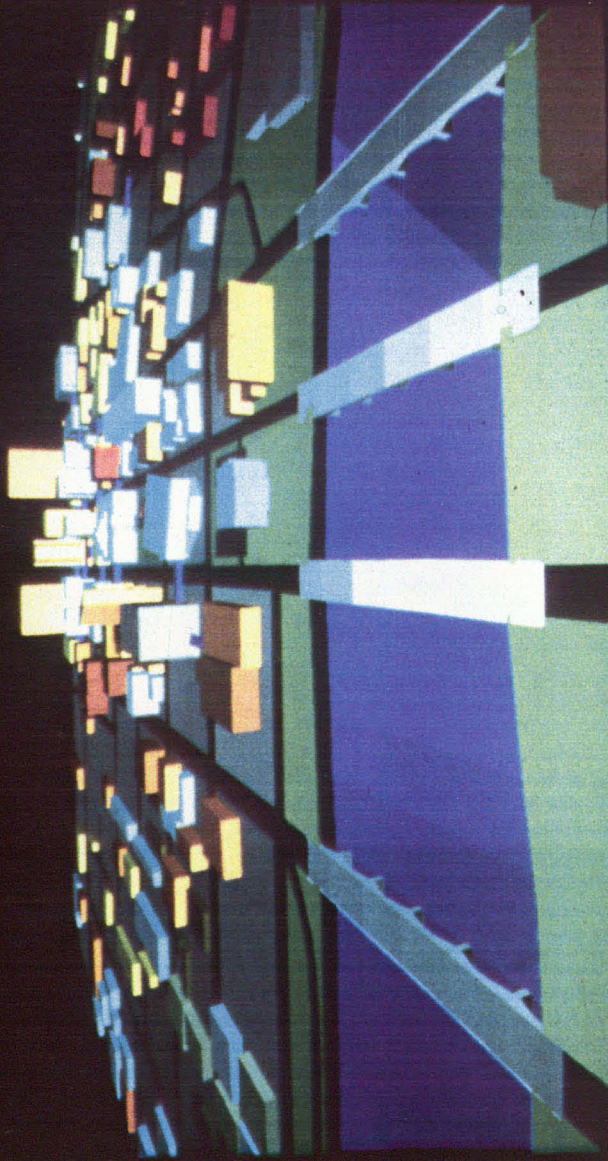
AN AERIAL VIEW OF DOWNTOWN FROM STATE CAPITOL  
DES MOINES





**Figure 22. A westward aerial view from the riverfront**

AN AERIAL VIEW OF DOWNTOWN FROM THE RIVERFRONT  
DES MOINES





**Figure 23. An eastward aerial view from the downtown core**

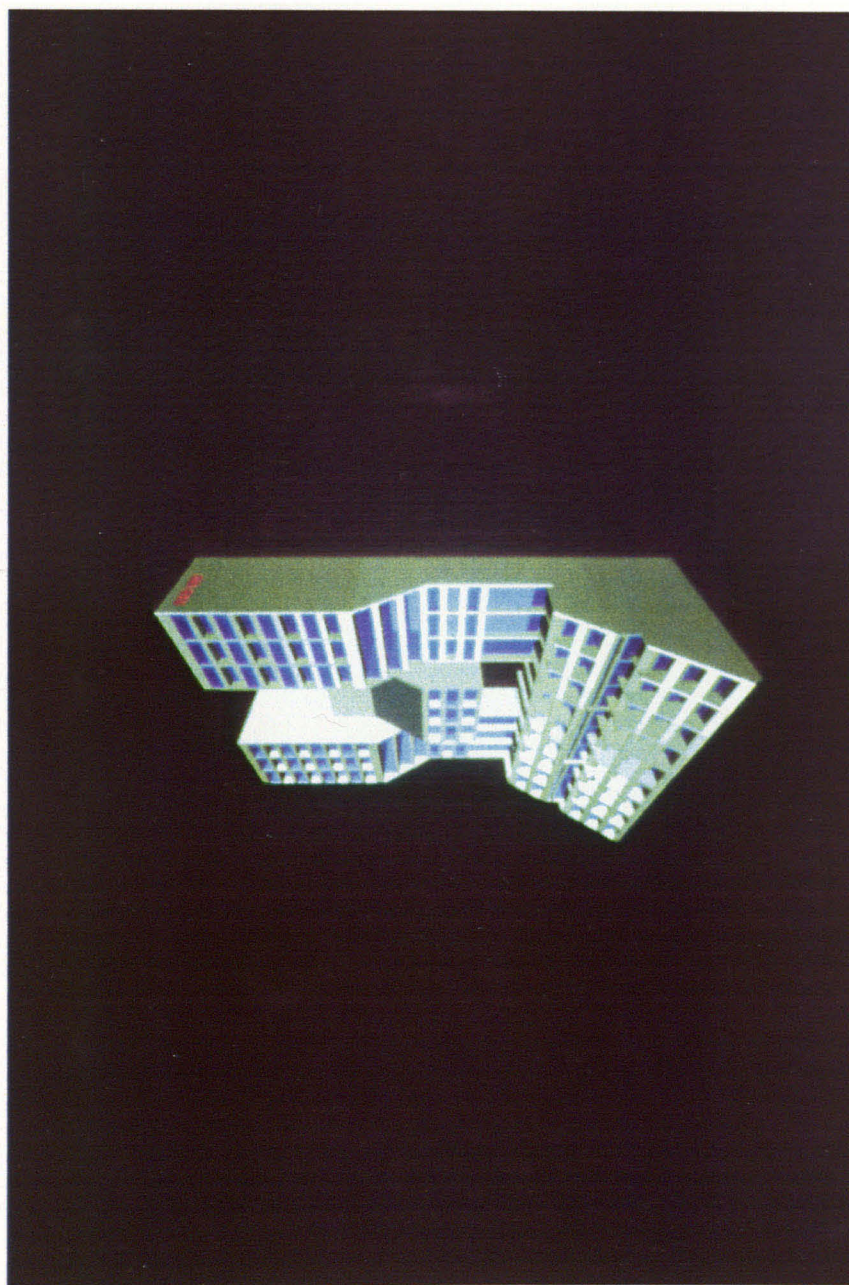


AN AERIAL VIEW OF DOWNTOWN FROM 8th ST. & KEO WAY  
DES MOINES





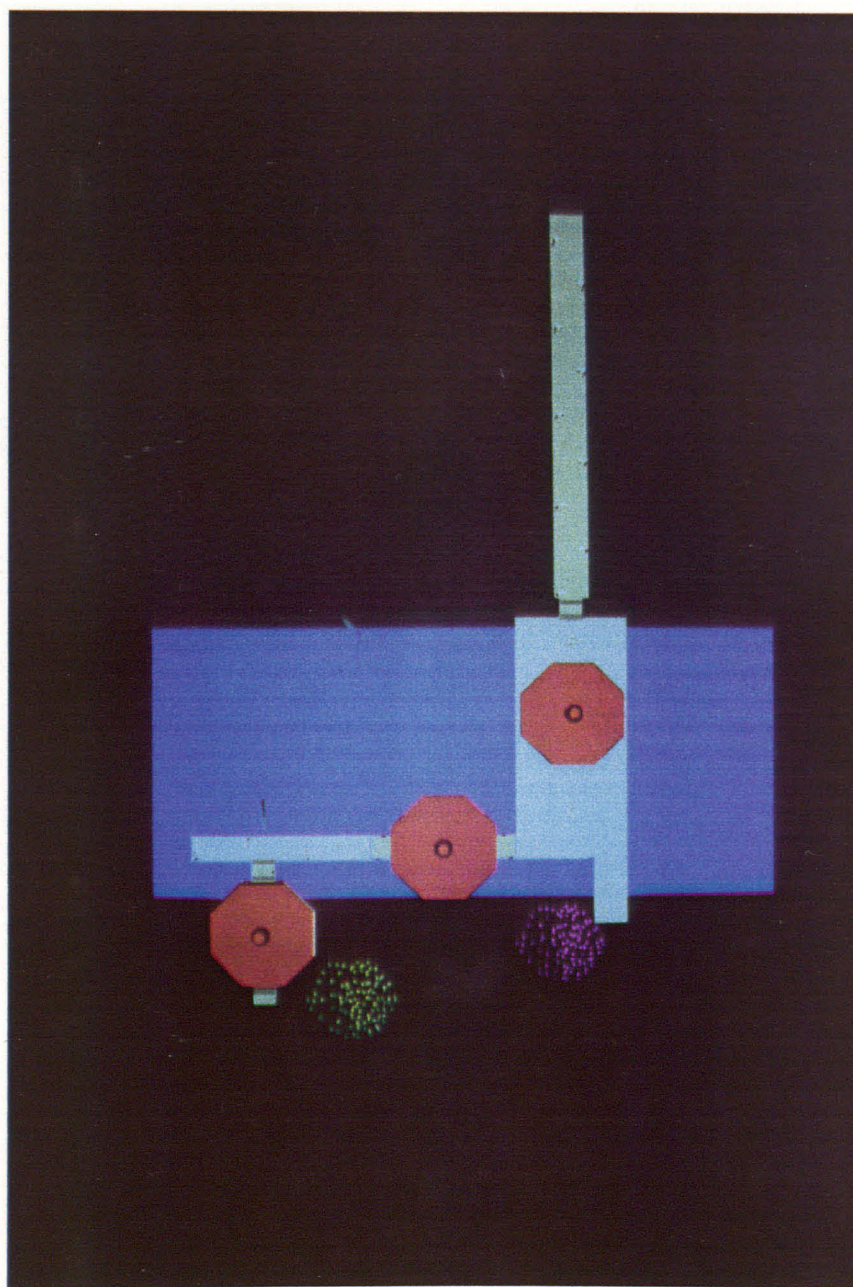
**Figure 24. A random proposal for a hotel on the riverfront**





**Figure 25. An alternative (random) proposal for a marina on the Iowa Power Plant site along the Des Moines riverfront**









**Figure 26. Partial site plan of the Des moines riverfront with the hotel and marina proposals incorporated**

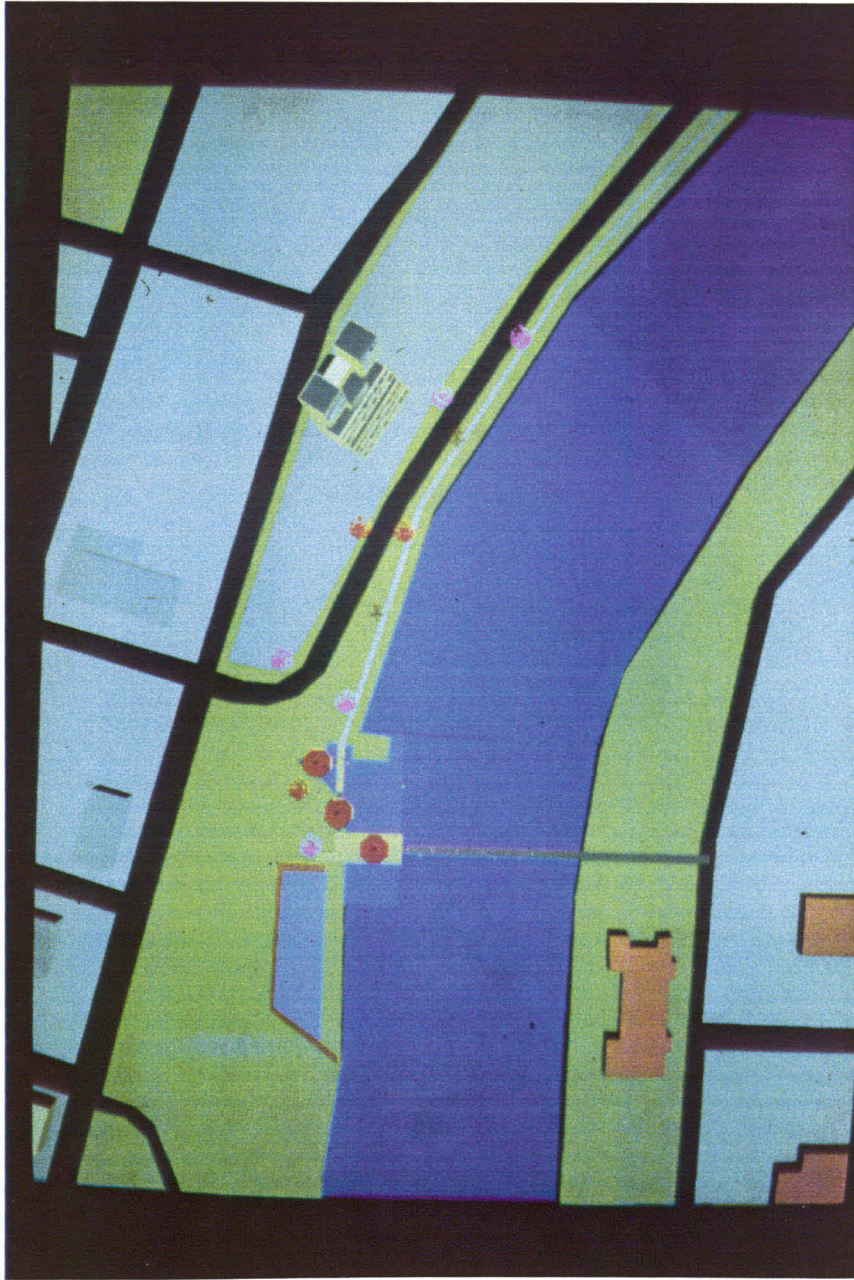




Figure 27. A southward aerial view of Des Moines downtown (existing) from Highway 235

AN AERIAL VIEW OF DOWNTOWN FROM THE RIVERFRONT  
DES MOINES

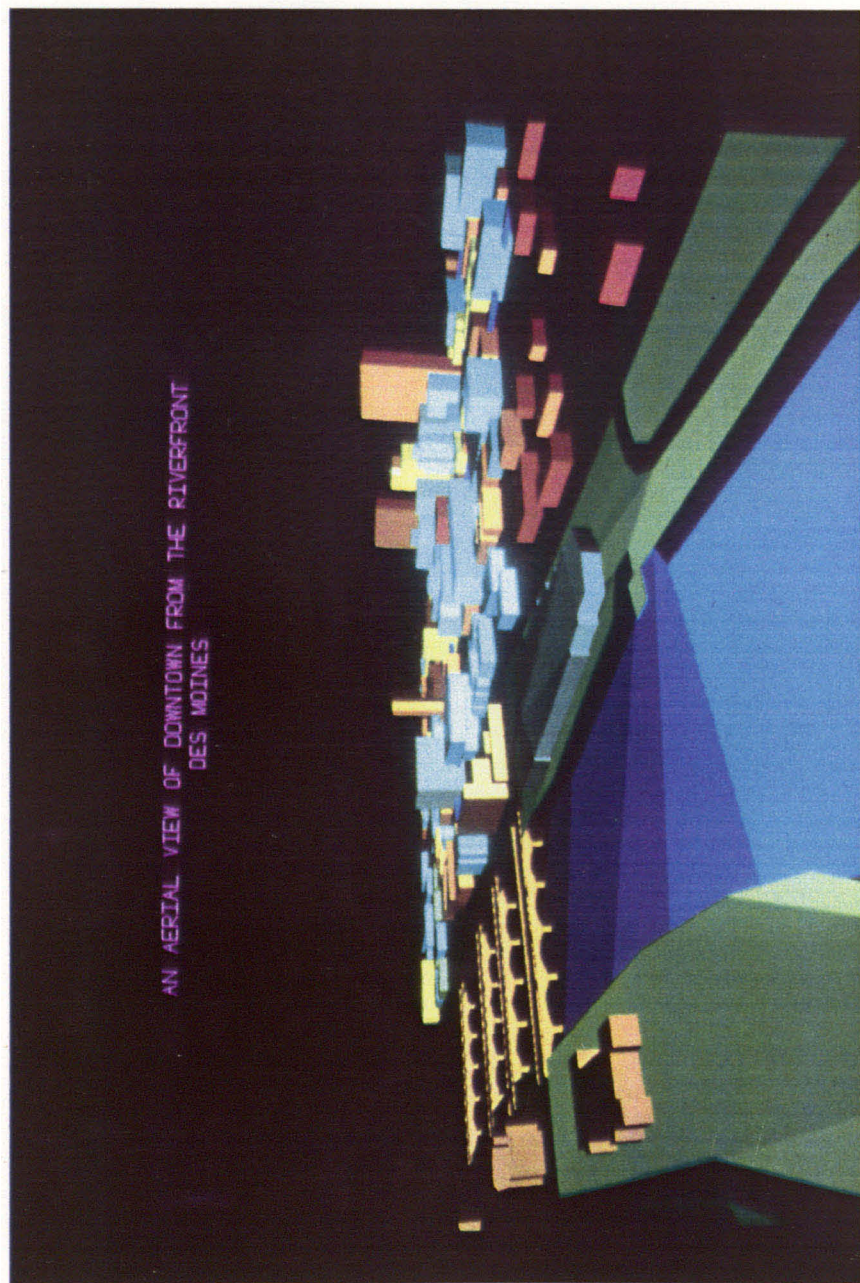
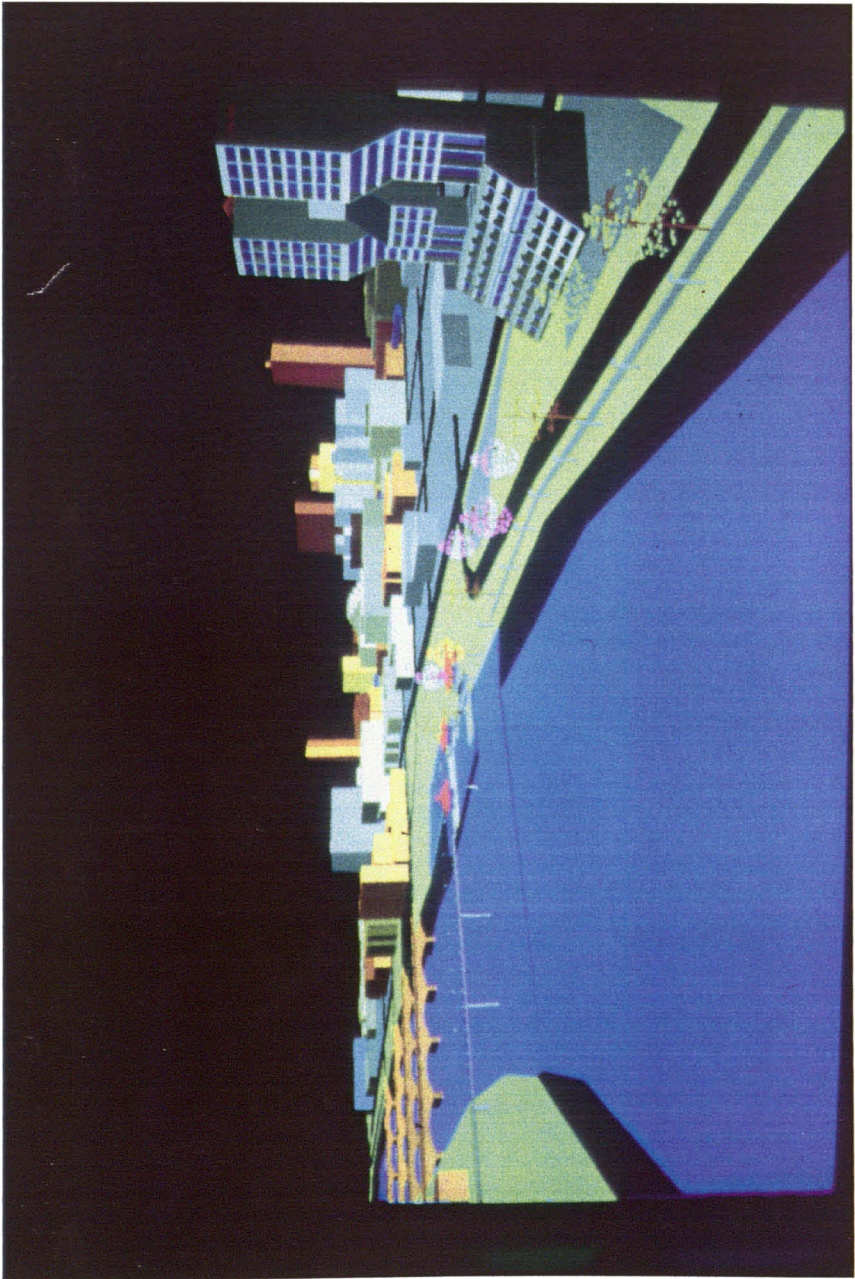




Figure 28. High-rise vs. low-rise: A proposed high-rise hotel is incorporated into the existing model (notice how the proposed hotel is blocking the views of the principle tower in the background)

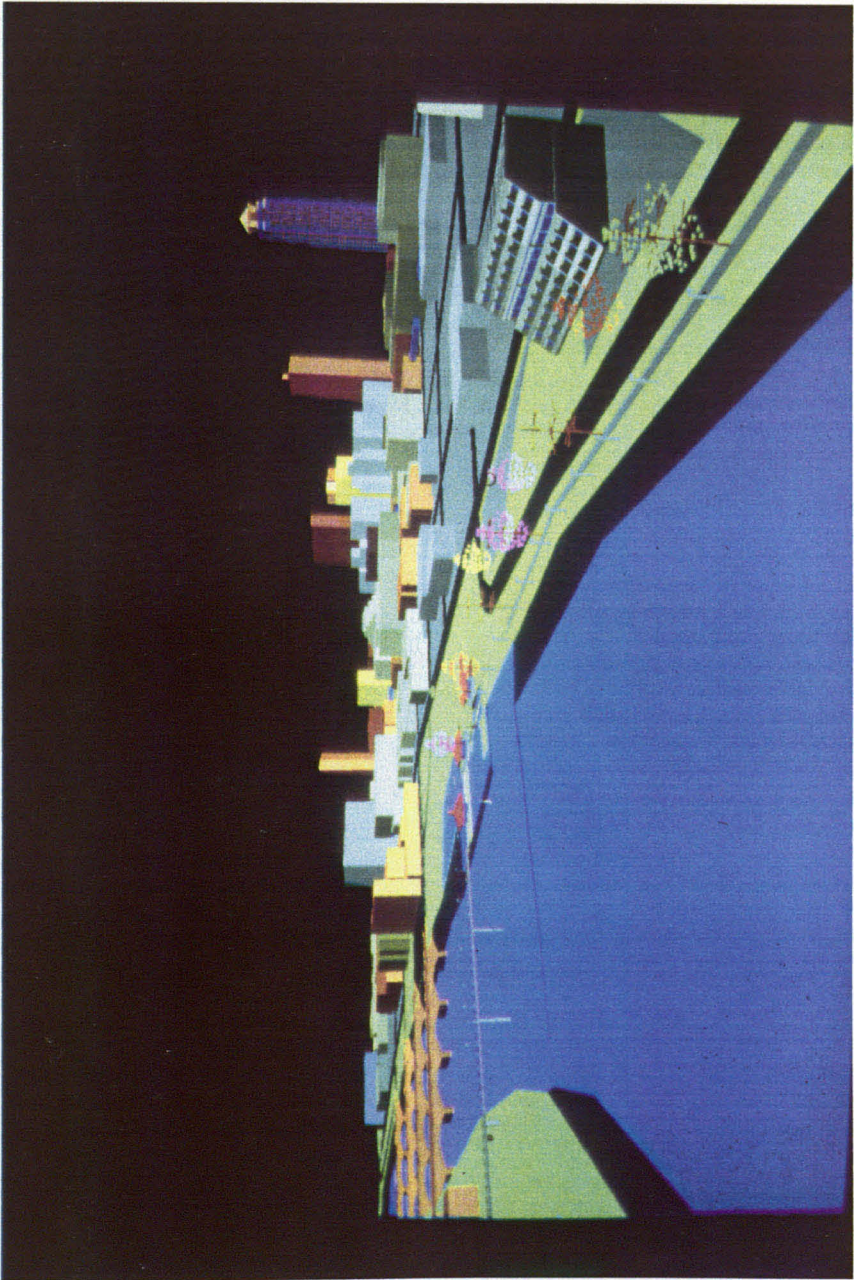






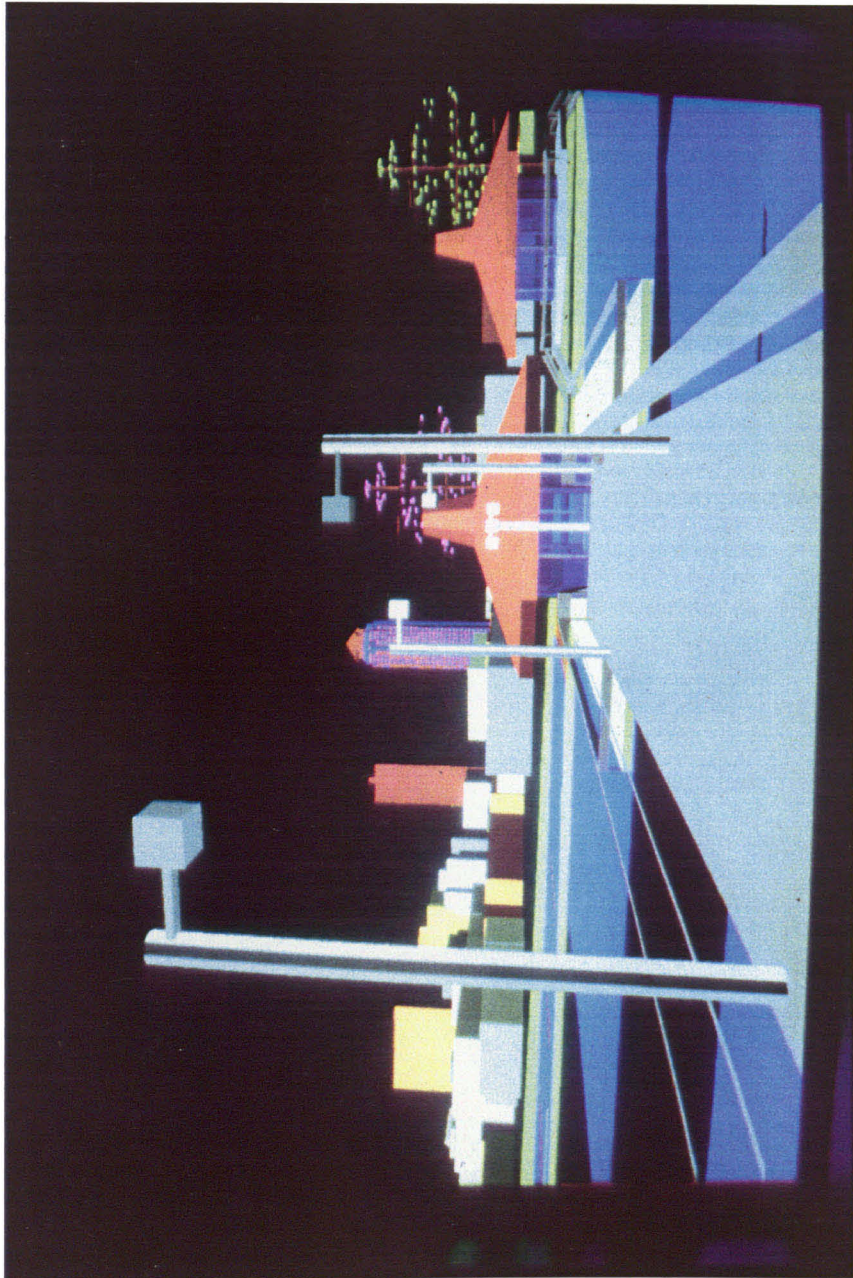


**Figure 29. High-rise vs. low-rise: An alternative proposal for a low-rise hotel on the same site**





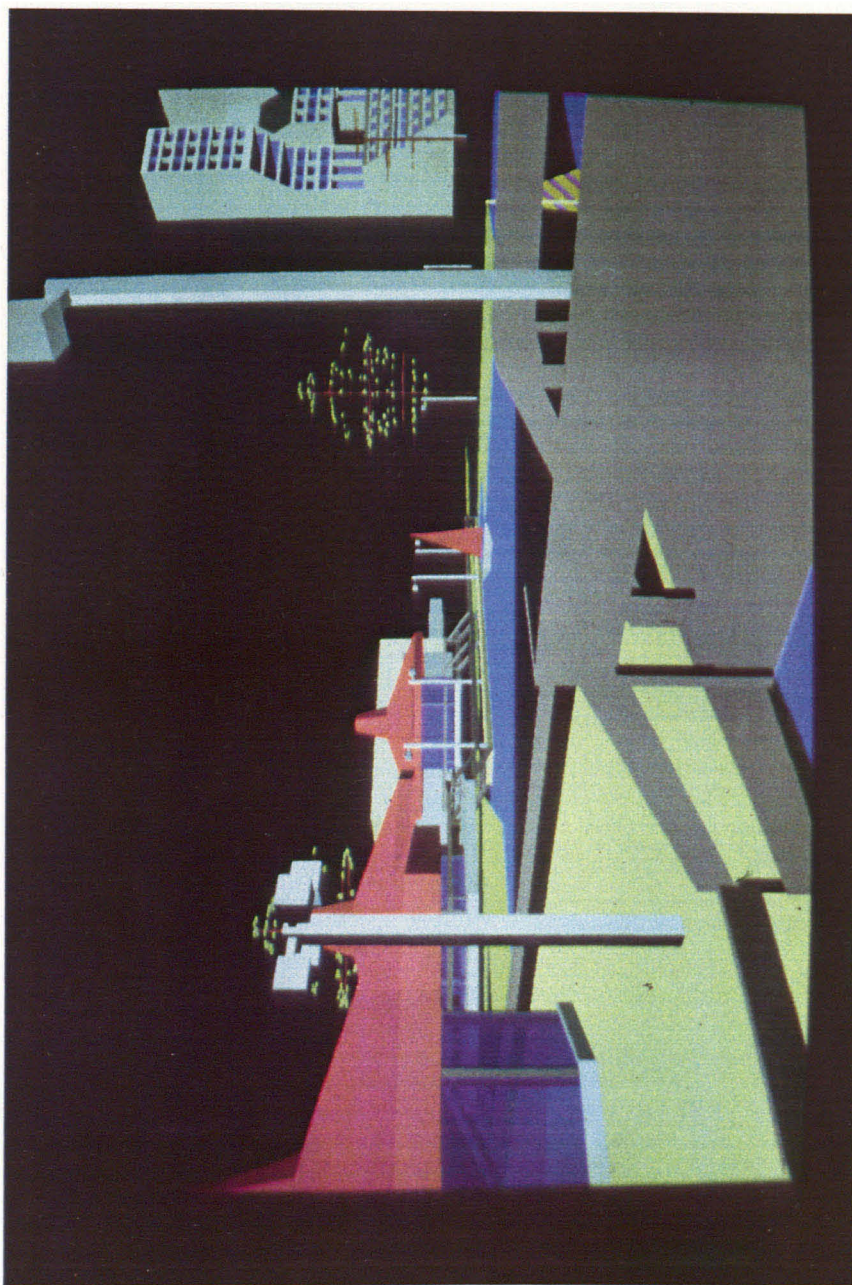
**Figure 30. A view of the proposed marina from the pedestrian bridge connecting the east and west sides of the river**





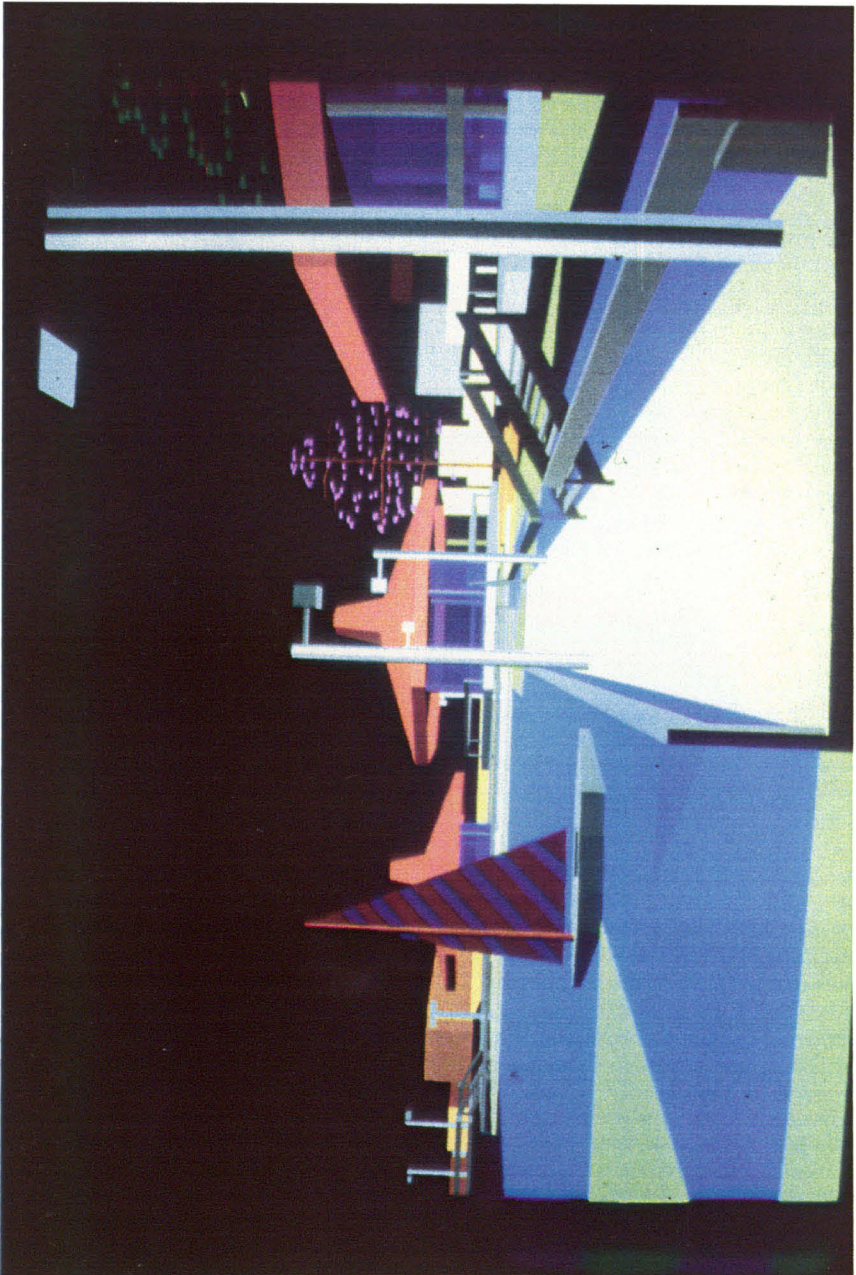
**Figure 31. A view of the proposed marina and the hotel from the east  
end of the pedestrian bridge**







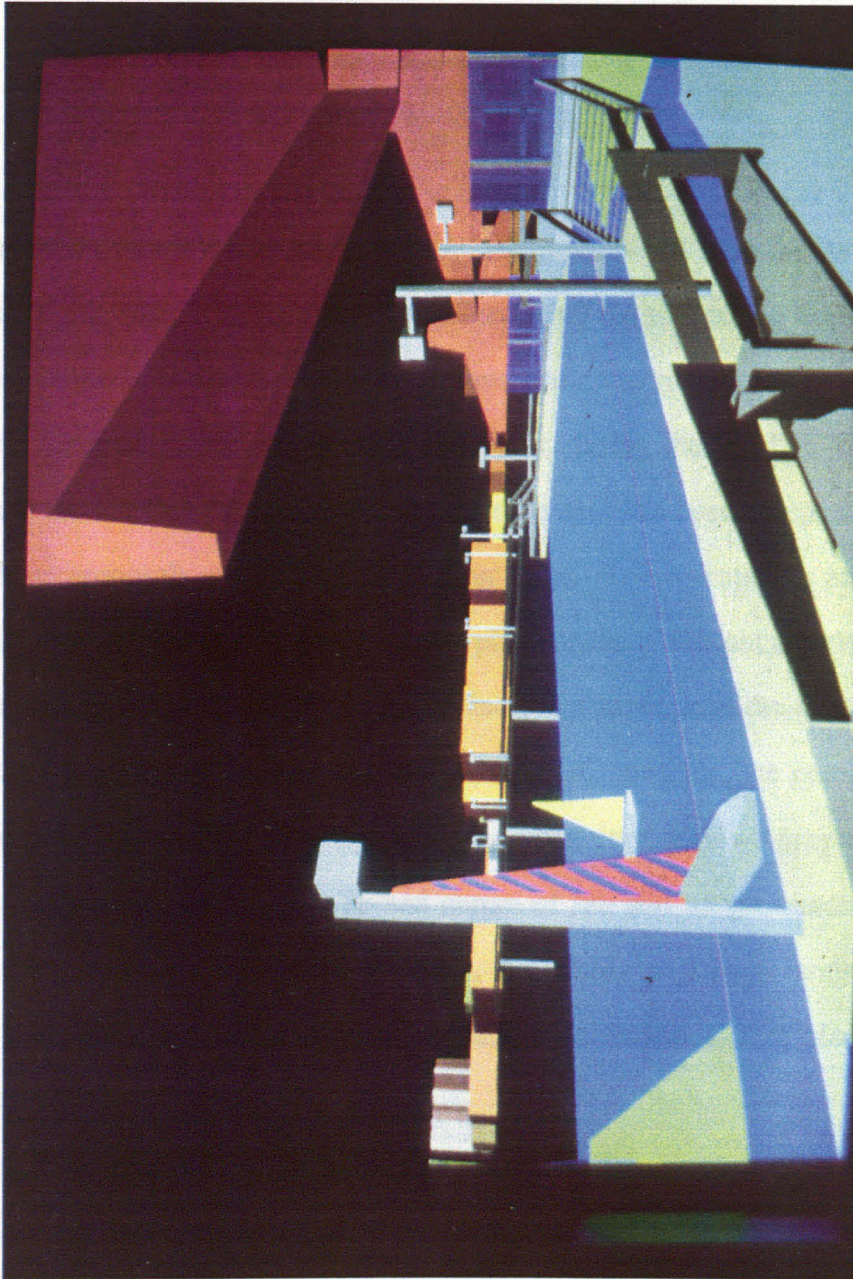
**Figure 32. A view of the marina looking south as approaching from the proposed hotel**





**Figure 33. A view looking eastward from the deck of one of the restaurants  
in the proposed marina**





## CHAPTER 8. CONCLUSIONS

The study was initiated with the basic assumption that both the downtown Des Moines and the riverfront areas are underutilized after the end of the normal business hours. This caused the area to feel deserted and unsafe to many residents of Des Moines and for most visitors of the city. However, during the last five years, an array of proposals for the Des Moines riverfront development has been in consideration and some of these proposals are in the construction stage. These proposals are fragmented and the city does not have a concrete master plan for the riverfront development.

According to Patricia Zingsheim, a principal planner with the City of Des Moines and a member of the Architectural Advisory Committee, the committee does not have written design guidelines. Instead, the committee reviews proposed projects on individual basis regarding the type and nature of site and its surroundings, the height of the proposed structure, lot coverage, the quality of design, landscape elements, architectural details and other aesthetic considerations (Des Moines Plan and Zoning Commission, 1986b).

The Des Moines 2000 land use concept allows for a variety of recreational, commercial, and residential uses along the Des Moines riverfront and further the city is now in the process of developing a master plan for the Des Moines riverfront.



Considering the above facts, it seemed important to explore some of the areas which the City of Des Moines has not yet attempted in the process of developing the master plan. The author believes that there is a need for evaluation research in the area of public oriented spaces. This study addressed the importance of the functioning of different public places surrounding the Des Moines riverfront. The basic assumption was that these user-behaviors would be dictating the type of development suitable for the proposed riverfront development. The rationale behind this approach was the acknowledged importance of evaluation research techniques and tools recommended by leading designers in the field of public-oriented spaces (refer to Chapter 3).

The study also recognized that the formal and restrictive design guidelines may discourage private developers from submitting their proposals for design review. Thus, this thesis recommended a set of guiding principles derived from the research. The research was conducted through personal interviews at four public places in downtown, surrounding the riverfront, to increase the understanding of the type of activities needed for the proposed development.

The survey primarily had two objectives. The first was to examine the goals set initially for the proposed development and the extent to which they have been confirmed. The second objective was to draw conclusions and related implications on the proposed development. The assumption for the later was that these implications would suggest the type of development needed while proposing the guiding principles.

The second area of concentration of this thesis was to emphasize the usefulness of Computer-Aided Design (CAD) system as a tool for an urban designer. It was recognized that there was an immediate need for an urban designer to use CAD system to simulate the proposals in an existing downtown setting. It is evident that architects

are using a CAD system as a tool in designing a building or a group of buildings. On the other hand, urban planners are using computers as a tool to integrate different database and geographic information systems. It was felt that there was a need to integrate these two different types of uses into one system. This could be used by an urban designer to simulate the proposals in an existing downtown environment and make decisions in terms of building mass, height and setback relationships. This type of system could further be used by an urban designer to associate different databases pertaining to the proposed building through Geographic Information Systems. This may assist an urban designer to incorporate the proposals into an existing model and simulate the proposals in an urban setting.

These issues were explored in the second part of the thesis and a three-dimensional visualization tool for an urban designer was demonstrated using computer graphics. For this demonstration, a complete relational database of the Des Moines downtown was prepared using Movie.BYU software for three-dimensional modelling. Based on the guiding principles derived from the survey results, proposals were developed separately using the same software and incorporated into the existing downtown model. The computer generated images demonstrated the importance of a CAD system for an urban designer to visualize the proposals in an existing downtown setting. It is to be noted that the software and the hardware used in this thesis are not the "state-of-the-art" technology even though these are high quality facilities. There is a wide variety of scope in this area and it is important to explore some of the areas where there is potential for further research.

### **Limitations and Further Research**

As mentioned earlier, the thesis is divided into two major areas of concentration. 1. The evaluation research of different public places in downtown through surveys and personal interviews. 2. Visualization of the proposals using computer graphics. These two areas were explored through different approaches, and each one of them has its own limitations and possible areas to be explored for further research. With this in mind, this section is divided into two parts focussing on individual areas for further research possibilities.

#### **Surveys**

While the findings from the surveys contributed to an understanding of how downtown public places are used and the extent to which they meet the goals, the results provided limited solutions to the identified problems. However, it opened up new dimensions to explore potential ideas for the Des Moines riverfront development.

If the City of Des Moines or others become interested in exploring these directions further, it would be important to recognize some of the limitations of this study.

First, the decision to not include a survey of non-users of the downtown visitors in the study design made it impossible to derive why people stay away. Evaluation research techniques explored in Chapter 3 stressed the importance of including a survey of potential users of these public places. Information from non-users should provide a measure of the riverfront's attractiveness within the large community and how non-users view the area under consideration (Friedman 1978, Rutledge 1975).

There are potentially two groups of non-users of importance to conduct further studies as follows.

1. A sample derived from the residents of the Des Moines Metropolitan area.
2. To look at the responses of using these public places by downtown employees in order to better understand the importance of the riverfront as a downtown amenity.

The time limitations of this study made it difficult for the author to include non-users in the survey and was recognized as one of its limitations.

The second limitation of the study was the sample size. A total of 128 interviews were conducted including both event and non-event days and different time periods of the day. However, it is important to note that though the sample was limited, an effort was made to stratify the sample into appropriate proportion of male, female, race and age of the population to assure that the sample represents the metropolitan population.

The limitations mentioned above could be expanded into some of the potential areas for further research. In association with the analysis presented in this report, one may do further research. For example, one could examine the use of these public places during four seasons of the year. The sample also could be extended to examine and compare the results derived from a similar project in any other medium sized city like Des Moines.

The second area for further research could be to include non-users as indicated in the limitations of this study. This could help in deriving more concrete conclusions for the riverfront development.

Another major area of investigation is the commercial aspects of vending areas, as well as the economic impact of these users on downtown revitalization.

### Visualization

As mentioned earlier, this kind of three-dimensional visualization could further be extended to animate a sequence of pictures to assist in the production of real time motion picture. Because of the availability of limited software and hardware resources, it is identified as one of the limitations of this study.

The second limitation of this section was the integration of non-graphical information and relational database management systems. The combined power of three-dimensional visualization and relational database management facilitate planners and designers to develop sophisticated polygon query and retrieval capabilities.

The limitations mentioned above could be expanded into some of the potential areas for further research. For example, one could further research in this area to associate a full set of three-dimensional modeling software for the facility manager's use. Visualization capabilities may be used during the design phase to help make design decisions based on realistic views, providing immediate feedback for a facility manager. It may further investigate to integrate a complete facilities management system blending with graphic and non-graphic database in an organized manner. For example, one could spatially cross-index a furniture drawing with a mechanical duct drawing and a building database. This resulting information creates a new, more relevant data source which can be used to track furniture requirements, evaluate projected space requirements or analyze personnel growth. The new technology could further assist to create a shared database from which many users can directly extract and link relevant information without unnecessary duplication. This linkage further assist facilities-oriented administrative records to be directly tied to graphic database.

The second area of further research possibilities are to integrate the three-dimensional visualization with Geographic Information Systems (GIS). A GIS collects, stores, analyzes and displays spacial data. The data in a GIS is referenced to a location or space which is called spacial reference. This technique assist planners and designers to evaluate land stability, soil conditions, topographical features, flood plain areas and similar geographic features pertaining to a particular tract of land.

**BIBLIOGRAPHY**

- Alexander, C., Ishakawa, S., and Silverstein, M. *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press, 1977.
- Balchen, B. and Linville, J. *The Waterfront: Let's Face It*. *AIA Journal*, 55 (1971): 17-28.
- Barnett, J. *An Introduction to Urban Design*. New York: Harper and Row Publishers, 1982.
- Bebee, K. *An Evaluation of Three Urban Riverfront Parks: Lessons for Designers*. Ann Arbor: The University of Michigan, 1984.
- Breen, A. *Four Waterfront Design Issues*. *Waterfront World*, 1, No. 6 (1982): 2-3.
- Contas, S. *Waterfronts "Where it's At": Leading Designers Believe*. *Waterfront World*, 1, No. 6 (1982): 1,4.
- Cook, R. *Zoning for Downtown Urban Design: How Cities Control Development*. Lexington, Massachusetts: Lexington Books, 1980.
- Dahl, O. *Des Moines: Capital City*. Tulsa: Continental Heritage Inc., 1978.
- Davenport, R. *The Use of Waterfront for Public and Private Recreation*. Washington, D.C.: National Academy of Sciences, 1980.
- Des Moines Plan and Zoning Commission. *A Developer's Guide to Downtown Housing Sites*. Des Moines: Plan and Zoning, 1986a.
- Des Moines Plan and Zoning Commission. *Architectural Advisory Committee Ordinance*. Des Moines: Plan and Zoning, 1986b.

- Des Moines Plan and Zoning Commission. Des Moines: Center of Iowa, A Survey of Historical Sites. Des Moines: Plan and Zoning, 1983.
- Des Moines Plan and Zoning Commission. Riverfront Development Plan. Des Moines: Plan and Zoning, 1973.
- Des Moines Register. Promenades and Plazas on Riverfront: 'Wish List'. Des Moines Register, August 5, 1987, p. 2M.
- Des Moines Register. Designer Envisions Des Moines as 'New American City'. Des Moines Register, January 17, 1989, p. 7M.
- Donaher, C. Boston's Waterfront Issues for Today and Tomorrow. Washington, D.C.: National Academy of Sciences, 1980.
- Eckardt, W. Urban Waterfront '83. Washington, D.C.: The Waterfront Press, 1984.
- Fein, A., ed. Landscape into Cityscape: Frederick Law Olmsted's Plans for a Greater New York City. Ithaca, New York: Cornell University Press, 1962.
- Friedman, A., Zimring, C., and Zube, E. Environmental Design Evaluation. New York: Plenum Press, 1978.
- Ghazali, J. Maximizing the Use of the Des Moines Riverfront: An Urban Design Study. Iowa State University, Ames, Iowa, 1987.
- Haber, S. A History of the Des Moines Riverfront Development. Des Moines: Plan and Zoning, 1986.
- Jacobs, J. The Death and Life of Great American Cities. New York: Random House, 1961.
- Movie.BYU Reference Manual. Brigham Young University, Provo, Utah: University press, 1983.
- Moore, A. Bright, Breathing Edges of City Life: Planning for American Benefits of Urban Water Resources. Washington, D.C.: Department of Interior, 1971.
- Rutledge, A. First National Bank Plaza: A Pilot Study in Post-construction Evaluation. Department of Landscape Architecture, University of Illinois, Champaign, Illinois, 1975.



- Rutledge, A. A Visual Approach to Park Design. New York: Garland STPM Press, 1981.
- So, F. Subdivision Regulation and Land Use Conservation. Washington, D.C.: The International City Management Association, 1979.
- Tsukio, Y. The Significance of Contemporary Waterfront Development. *Process: Architecture*, 52 (December 1984): 10-13.
- U.S. Bureau of the Census. Census of the Population. Washington, D.C.: Bureau of Census, 1980.
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Improving Your Waterfront: A Practical Guide. Washington, D.C.: U.S. Government Printing Office, 1980.
- Weirick, F. The Effective Treatment of Urban Riverfronts, Particularly Rivers Within Iowa Cities. Department of Civil Engineering, Iowa State University, Ames, Iowa, 1914.
- Whyte, W. The Social Life of Small Urban Spaces. Washington, D.C.: The Conservation Foundation, 1980.
- Wrenn, D. Urban Waterfront Development. Washington, D.C.: Urban Land Institute, 1983.

## ACKNOWLEDGEMENTS

Several people have been particularly helpful to me in completing this research. I thank my co-major professors, Dr. Duane Shinn (Department of Community and Regional Planning) and Prof. Rabindra Mukerjea (Department of Architecture), whose enthusiastic interest in my research gave me the impetus to pursue this study. I am grateful for their sincere willingness to help, and their patience with me in completing this study.

I thank Prof. Mark Chidister (Department of Landscape Architecture), whose insightful comments have greatly improved the quality of this thesis. He particularly aided me by providing constructive criticism and suggestions throughout the course of this study.

I owe my very special thanks to Dr. Thomas Galloway, dean of the college, whose constant interest and encouragement, and generous support have been invaluable.

Finally, I express my appreciation to my family for providing constant support and encouragement during my entire graduate studies in the U.S.A.

To each of these people, and to each one of the students with whom I shared classes, coffee, and ideas, Thank You.

## APPENDIX. INTERVIEW QUESTIONNAIRE

1. Is this your first visit to this place?  
Yes ☐ No ☐
  
- 1a) How many times you visited before?  
 a) never ☐      b) once or twice ☐  
 c) three-five times ☐      d) more than five times ☐
  
- 1b) During your past visit were you here:  
 a) In the morning ☐      b) At lunchtime ☐      c) In the evening ☐  
 d) On a weekday ☐      e) On a weekend ☐      f) During an event ☐  
 g) Don't remember ☐
  
2. How much time do you think you will be spending here today?  
 a) < 1 hour ☐      b) 1-2 hours ☐      c) > 2 hours but < 3 hrs ☐  
 d) 3 hours or more ☐      e) Don't know ☐
  
3. Did any one else come here with you today?  
Yes ☐ No ☐
  
- 3a) Who came with you?  
 a) Family ☐      b) Friends ☐      c) Both ☐      4) Others \_\_\_\_\_
- 3b) How many of them were there?  
 a) One ☐      b) 2-3 ☐      c) 4-10 ☐      d) More than 10 ☐
  
4. How did you get here?  
 a) Drive ☐      b) Walk ☐      c) Bus ☐      d) Bicycle ☐      e) Others \_\_\_\_\_
  
- 4a) Was parking a problem for you?  
Yes ☐ No ☐
- 4b) What kind of problem?  
 a) Hard to find ☐      b) Too expensive ☐  
 c) Too far away ☐      d) Others \_\_\_\_\_
  
5. What is your primary reason for being here (downtown) today?  
 a) Work ☐      b) Visit ☐      c) Shopping ☐  
 d) Tourist ☐      e) Event ☐      f) Others \_\_\_\_\_
  
- 5a) Do you work downtown?  
Yes ☐ No ☐
  
6. How important was your visit to this place when you decided to come downtown?  
 a) Very important ☐      b) Fairly important ☐  
 b) Not very important ☐      d) Not at all important ☐

7. Where else will you be going in the downtown area today?

- a) Nowhere ☐ b) Work ☐ c) Shopping ☐  
 d) Restaurant/Entertainment ☐ e) River's edge ☐ f) Others \_\_\_\_\_

7a) Have you been or do you intend to go over to the walkway by the river?

Yes ☐ No ☐

7b) Reason \_\_\_\_\_

8. The following words might describe this place, tell me if you:

- a) Agree strongly b) Agree somewhat c) Disagree d) Don't know

Description of the place	a	b	c	d
a) Crowded				
b) Well maintained				
c) Fun				
d) Restful				
e) Attractive				
f) Lots to do				
g) Safe				
h) Good place to bring friends				

9. Would you feel safe coming here during the following times?

Time Period	Yes	No
a) Lunchtime		
b) Afternoon		
c) Evening		

10. We are here at \_\_\_\_\_ why do you come to this particular place today?  
 Reason:

12. How much time do you think you will be spending in this particular place today?

- a) < 30 mts. ☐ b) 30 mts - 1 1/2 hrs ☐  
 c) Bet. 1 1/2 - 3 hrs. ☐ d) > 3 hrs. ☐

13. Do you live in the city of Des Moines, suburbs or some where else?

a) The city of Des Moines ☐ b) Des Moines suburbs ☐

c) Outside Des Moines but within Iowa ☐

d) Outside Iowa (Write city name \_\_\_\_\_)

13a) Do you live within a 15 minutes walk from here?

Yes ☐ No ☐

14. What do you like best about this place?

15. What do you like least about this place?

### OBSERVATIONS

Time: \_\_\_\_\_

Date: \_\_\_\_\_

Length of interview: \_\_\_\_\_

Respondent was:

a) Male ☐ Female ☐

b) White ☐ Black ☐ Others ☐

c) Under 18 yrs. ☐ 19-30 yrs. ☐

30-60 yrs. ☐ Over 60 yrs. ☐

Weather was:

a) Cloudy/Overcast ☐ b) Partially cloudy ☐ c) Sunny/bright ☐

### COMMENTS: